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PROCEEDINGS

OF THE

NATIONAL INSTITUTE OF SCIENCES OF INDIA

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1935

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Introductory Note

The National Institute of Sciences of India was founded on the 7th January, 1935, at a meeting held in the Senate House of the Calcutta University under the chairmanship of Dr. J. H. Hutton, President, Indian Science Congress. This meeting was honoured by the presence of His Excellency Sir John Anderson, Governor of Bengal, who delivered an address and inaugurated the Institute. Thereafter Dr. L. L. Fermor, the President of the National Institute of Sciences of India, delivered his Inaugural Address.

The First Ordinary General Meeting of the Institute was held on the following day in the rooms of the Asiatic Society of Bengal.

The National Institute proposes to issue four publications :—

1. *Transactions*, to be issued at irregular intervals as material accrues.
2. *Proceedings*, for the record of the business of the Institute, and for the publication of short articles.
3. A consolidated *Comptes rendus* of abstracts of papers read before the National Institute and the co-operating Academies, and later of all papers published by scientific societies and organisations in India. Title not yet selected.
4. An *Annual Record* of the progress of Science in India.

The first number of the *Transactions* has already been issued, and this is the first number of the *Proceedings*.

In view of the fact that the Institute was founded in accordance with the scheme devised by the Academy Committee appointed at a meeting of the General Committee of the Indian Science Congress Association held at Bombay on the 3rd January, 1934, it is proposed to include in the first number of the *Proceedings* not only the record of the proceedings at the Inaugural Meeting and the First Ordinary General Meeting, but also the Report of the Academy Committee as accepted by the General Committee of the Indian Science Congress, the Provisional Rules to be enforced in the first year, and the List of Foundation Fellows of the National Institute.

Inaugural Meeting

The Inaugural Meeting of the National Institute of Sciences of India was held in the Senate Hall of the University of Calcutta at 5-30 P.M. on Monday the 7th January, 1935. Dr. J. H. Hutton, President of the Indian Science Congress, was in the chair, supported by Dr. L. L. Fermor, President of the National Institute of Sciences of India, and the meeting was honoured by His Excellency Sir John Anderson, Governor of Bengal, who was present for the purpose of inaugurating the National Institute.

At this meeting there was a large gathering of scientists from all parts of India, with many of the eminent public men of Calcutta including Judges of the High Court, Members of the Government of Bengal, the Mayor of Calcutta, the Vice-Chancellor of the Calcutta University, representatives of the educational and scientific institutions, the learned societies, and the Chambers of Commerce of Calcutta, University teachers and many others; among those present mention may be made of:

Sir Harold Darbyshire; Hon. Mr. R. N. Reid; Hon. Sir B. L. Mitter; Hon. Nawab Bahadur Sir K. G. M. Faroqui; Hon. Khan Bahadur Abdul Aziz; Mr. Syama Prasad Mookerjee; Hon. Kunwar Jagadish Prasad; Mr. Nalini Ranjan Sarkar; and the following Foundation Fellows:—

Prof. S. P. Agharkar, Prof. P. R. Awati, Rao Bahadur G. N. Rangaswami Ayyangar, Dr. K. D. Bagchi, Prof. K. N. Bahl, Prof. A. C. Banerji, Dr. S. K. Banerji, Lt.-Col. O. A. R. Berkeley-Hill, Mr. T. P. Bhaskara Shastri, Prof. S. S. Bhatnagar, Prof. D. M. Bose, Dr. G. S. Bose, Sir U. N. Brahmachari, Mr. B. C. Burt, Mr. C. C. Calder. Dr. Haraprasad Chaudhuri, Lt.-Col. R. N. Chopra, Brigadier H. J. Couchman, Sir Kedarnath Das, Prof. B. B. Dey, Prof. N. R. Dhar, Prof. H. B. Dunnicliff, Mr. P. Evans, Dr. L. L. Fermor, Dr. C. S. Fox, Prof. J. C. Ghosh, Prof. P. N. Ghosh, Dr. S. L. Hora, Dr. J. H. Hutton, Prof. M. O. P. Iyengar, R.B. L. K. Ananthakrishna Iyer, Lt.-Col. R. Knowles, Dr. K. S. Krishnan, Dr. K. V. A. Krishnan, Prof. P. C. Mahalanobis, Prof. K. C. Mehta, Prof. S. K. Mitra, Prof. P. C. Mitter, Prof. J. N. Mukherji, Col. A. Olver, Prof. Ganesh Prasad, Dr. Baini Prashad, Dr. H. S. Pruthi, Prof. Muzaffaruddin Qureshi, Mr. P. R. Ray, Rai Bahadur S. C. Roy, Prof. M. N. Saha, Prof. B. Sahni, Principal B. M. Sen, Prof. H. K. Sen, Prof. N. R. Sen, Dr. F. J. F. Shaw, Prof. B. K. Singh, Dr. E. Spencer, Lt.-Col. A. D. Stewart, Prof. T. S. Tirumurti, Rao Bahadur Prof. B. Venkatesachar, Rao Bahadur B. Vishwanath, Mr. D. N. Wadia, Mr. W. D. West.

Dr. J. H. Hutton, President, Indian Science Congress, and Chairman of the meeting, in inviting His Excellency Sir John Anderson, Governor of Bengal, to inaugurate the Institute, said:

Your Excellency,

A year ago under the guidance of Professor Saha the Indian Science Congress appointed a committee to draft a constitution for, and to take the necessary steps to bring into being, a national scientific body which should perform for India some of those functions which the Royal Society performs for Great Britain. That committee, not without meeting difficulties, has carried out the work for which it was appointed, and the constitution drafted has been accepted by the Indian Science Congress. It remains to call the body into existence, and I have the honour, as representing the Indian Science Congress in 1935, of asking Your Excellency to inaugurate the National Institute of Sciences of India.

His Excellency then inaugurated the National Institute. His address is printed on pages 6–9.

Thereafter Dr. L. L. Fermor, President of the National Institute of Sciences of India delivered his Inaugural Address, which is printed on pages 10–26.

On the termination of the President's address, Professor S. P. Agharkar, one of the Secretaries of the National Institute, read out the following list of names of the learned bodies that had sent representatives and messages of congratulation to the National Institute at its inaugural meeting :—

1. Asiatic Society of Bengal.
2. United Provinces Academy of Sciences
3. Indian Academy of Sciences.
4. Indian Botanical Society.
5. Indian Chemical Society.
6. Calcutta Mathematical Society.
7. Benares Mathematical Society.
8. South Indian Science Association.
9. Association of Engineers.
10. Institute of Engineers (India).
11. The Geological, Mining and Metallurgical Society of India.
12. Indian Psychological Association.
13. Society of Biological Chemists, India.
14. Indian Physical Society.
15. Mining and Geological Institute.

In addition, expressions of good wishes for the success of the National Institute had been received personally by the President from the following members of the Governor-General's Council: the Hon'ble Sir James Grigg, the Hon'ble Sir Fazl-i-Husain, and the Hon'ble Sir Frank Noyce; and also from three of the senior scientists of India, Sir J. C. Bose, Sir Martin O. Forster, and Sir P. C. Ray.

Prof. S. P. Agharkar then proposed a hearty vote of thanks to His Excellency Sir John Anderson for having consented to inaugurate the National Institute of Sciences of India, which was carried with acclamation.

First Ordinary General Meeting

The First Ordinary General Meeting of the National Institute of Sciences of India was held in the rooms of the Asiatic Society of Bengal, 1, Park Street, Calcutta, at 11 A.M. on the 8th January, 1935. The following 37 Fellows were present and signed the Obligation Form :—

Prof. S. P. Agharkar
Prof. P. R. Awati
Prof. A. C. Banerji
Mr. T. P. Bhaskar Shastri
Prof. D. M. Bose
Sir U. N. Brahmachari
Mr. B. C. Burt
Mr. C. C. Calder
Dr. H. Chaudhuri
Brigadier H. J. Couchman
Mr. P. Evans
Dr. L. L. Fermor
Dr. C. S. Fox
Prof. J. C. Ghosh
Dr. S. L. Hora
Dr. J. H. Hutton
Rao Bahadur L. K. A. Iyer
Dr. K. S. Krishnan
Prof. S. K. Mitra
Prof. P. C. Mitter
Prof. J. N. Mukherjee
Col. A. Olver
Prof. Ganesh Prasad
Dr. Baini Prashad
Dr. H. S. Pruthi
Prof. M. Qureishi
Rai Bahadur S. C. Roy
Prof. M. N. Saha
Prof. B. Sahni
Principal B. M. Sen
Prof. H. K. Sen
Prof. N. R. Sen
Dr. F. J. F. Shaw
Prof. B. K. Singh
Mr. D. N. Wadia
Mr. F. Ware
Mr. W. D. West.

The result of the ballot for the election of the Council of the National Institute was announced. Prof. B. Sahni was elected Vice-President in the vacancy caused by the death of Prof. S. R. Kashyap.

The names of the representatives of the co-operating academies and of the Indian Science Congress Association on the Council were announced.

A full list of the Council is given on pp. 27–29.

Presents to the Institute were announced.

The following papers were read :—

(i) 'Synopsis of the Pre-Vindhyan Geology of Rajputana' by Dr. A. M. Heron, D.Sc., F.R.S.E.

(ii) 'Physiology, Bionomics, and Evolution of the air-breathing fishes of India' by Dr S. L. Hora, D.Sc., F.R.S.E., F.A.S.B.

(iii) 'Problems of the Solar Corona' by Prof. M. N. Saha, D.Sc., F.R.S., F.A.S.B.

(iv) 'Ionospheric Height measurements at Allahabad' by Mr. G. R. Toshniwal (communicated by Prof. M. N. Saha).

(v) 'On the Electron Theory of Metals' by Dr. R. C. Majumdar, Ph.D., University of Lahore (communicated by Prof. M. N. Saha).

(vi) 'On Symmetrical Space with minimum rate of expansion' by Prof. N. R. Sen.

(vii) 'New facts regarding infection of Citrus Colletotrichum gleosporoides' by Dr. H. Chaudhuri, Lahore.

(viii) 'Synthetic Enzyme' by Prof. H. K. Sen and Mr. Sobhanlal Banerji.

(ix) 'On the question of the Expansibility of Zero in series of Legendre functions having non-integral parameters' by Prof. Ganesh Prasad.

(x) 'On the Cataphoretic speed and Inorganic Colloids' by Prof. J. N. Mukherjee, Mr. S. G. Chaudhuri, and Mr. B. N. Ghosh.

(xi) 'Mon and Munda in India and beyond' by Dr. J. H. Hutton, C.I.E., D.Sc., I.C.S.

With a vote of thanks to the chair the meeting terminated.

His Excellency's Speech at the Inauguration of the first session of the National Institute of Sciences of India on 7th January, 1935

DR. FERMOR, LADIES, AND GENTLEMEN,

An occasion such as this reminds me how multifarious are the demands made upon the services of a Governor in India. In part they call for the bestowal of blessings or the payment of compliments and as regards this portion of one's activities inclination may not always march abreast with duty. The present occasion, however, is one on which inclination and duty coincide. I remember, and, to take you into my confidence, I remember sometimes with a tinge of regret, the days when my own preparation for life was based on the contemplation of a scientific rather than an administrative career. Although it finally came about that I elected to tread administrative paths, I have never regretted the scientific training which I received during some of the most impressionable years of my life, because that training afforded me an understanding of the best methods of approach to the solution of scientific problems which I trust years of the hurly-burly of administration have not entirely extinguished, even if to my misfortune it may have become somewhat dimmed. I have not regretted it because I think that the detached outlook of the scientist may often be an asset to an administrator. Conversely I think that a knowledge of practical administration must often be helpful to a man of science and this was forcibly brought home to me when listening to the admirable and most interesting address delivered by Dr. Hutton at the inauguration ceremony * in this Hall on Wednesday last, for Dr. Hutton is not only a distinguished scientist but is also a distinguished administrator, and his address was punctuated by repeated illustrations of the application of scientific researches to the practical problems of everyday life. The popular conception of a scientist is that of a man who pursues truth for its own sake and with no interest, or at any rate no selfish interest, in the practical application of his discoveries, and I can conceive no better way for scientists each pursuing his own special line of research to correlate their investigations and to turn them into practical channels than the formation of some central Institute by means of which their ideas can be pooled and brought into relation with each other. I can see no limit to the field of usefulness which this new Institute of Sciences can cultivate, for its purpose is to co-ordinate the work of such academic bodies as have already been created in various parts of India and as may be created in the future. Many members of this Institute are Chemists and will be aware of the remarkable progress made in synthetic

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* The opening meeting of the 22nd Session of the Indian Science Congress on 2nd January, 1935.

chemistry during the present century. These members may wish to employ some form of synthetic action in building the structure of this academic body. Others who are Anthropologists or Psychologists will naturally apply the lessons of their sciences to the aspects of social life and human organisation presented by this new institution. Those who are Botanists or Agriculturists, understanding all the mysteries of seedtime and harvest, may be expected to be valued gardeners in, shall I say, this academic grove. If the creation of this new body has given rise to some birth pangs, the medical members will know that this is nothing strange and they may be able to prescribe a regime of life calculated to promote healthy growth and to inhibit the normal disorders of youth and adolescence. And as man is after all a member of the animal creation, it is probable that the Zoologists may find in their own science matter which may be of help to this new body. Even the Mathematicians should have some ideas on such aspects of structures and numbers as must be manifest in the life of an academic body. In short all the sciences represented in your institution are capable of contributing to the wise guidance of your body corporate. Even the Geologists who at first sight might seem to be rather out of the picture should be able to help, for their study of fossil-bearing strata may enable them to detect and to avert any premature fossiliferous tendency should this begin to manifest itself. With considerable diffidence I suggest that this consideration may have been one of the reasons why you have chosen as your first President a distinguished representative of geological science whose special knowledge of ancient petrifaction makes him so fully aware of the necessity for mobility and vitality.

To turn from a consideration of the component parts of this new body and of the way in which they can function to the best possible advantage of the whole, I should like to attempt a very brief summary as I see it of the sequence of events which has led up to this evening's gathering. A philosopher has rightly characterised the great intellectual transition in the west, contrasting the mediæval with the modern conception of life, as the transition from an attitude in which man interpreted nature by tradition to an attitude in which he corrected tradition by observation of nature. The first organised step in this direction in India may be said to date from the foundation of the Asiatic Society of Bengal in this very city in 1784. The second step dates from the middle of the last century. In 1857 the Calcutta University was founded, followed at short intervals by a number of other universities. In addition there were a series of great scientific surveys during the 19th century. The third step was the meeting of the Indian Science Congress for the first time in 1914. To-day as a fourth step in the progressive organisation of modern science in India we are met together to inaugurate the National Institute of Sciences in India. We have here the sequence as follows :—

First, a society of a varied and comprehensive character.

Secondly, three quarters of a century later, Universities and specialist scientific services.

Thirdly, half a century later, the annual meeting of individual scientists.

Fourthly, after another quarter of a century, a central and all-India co-ordinating body, embracing all modern scientific research in this great country.

It seems to me that this gradual, and yet at the same time accelerated, progress is regular and natural and therefore highly satisfactory. The various steps forward indicate the gathering of sound fruit produced as the result of steady labour. There is in this evolution no putting of the cart before the horse.

That this Institute should be the result of steady and healthy growth augurs well for its future and for the quality of its work, because it will have to deal with gigantic problems. Science in the modern sense of the word has been implanted in India through the largely accidental external influences of colonization aided by free communications with other parts of the world which have themselves developed differently and at a different pace. This vast country which is inhabited by at least 350 million people is as regards the illiterate masses in much the same condition as Europe during the middle ages. To those who have the time and the inclination it may afford an interesting field of speculation to consider what will be the result of the interaction between this modernism of the few and the traditionalism of the many. In the various countries of Europe the two views have contended and striven side by side for centuries sometimes with extreme bitterness. As a result of this running fight the solution has taken different shapes among the different races and nations and in some places a satisfactory compromise has not yet been found. What the result will be in India cannot be foreseen and it is wise never to prophesy unless one is certain. There is a humorous if cynical cliché on this subject to the effect that 'He who bets on a certainty is a rogue : he who does not is a fool'. This much however, is sure that the eventual result will largely depend on the wisdom, insight and intellectual calibre of those representing the ideas and sciences which this Institute has been founded to promote. Dr. Hutton in the course of his inaugural address said that scientists should beware of valuing themselves and one another too highly and of supposing that because a man knows a great deal about one subject he is therefore the more fitted to express an opinion on others. This wise admonition has been put in another way by a witty though possibly somewhat jaundiced thinker who once said that it should never be forgotten that if a learned man is stupid, he can be so learnedly stupid as to be much more dangerous than the ordinary stupid man in the street. My good friend, Mr. van Manen, told me the other day of a striking epigram of eight words in which Confucius expressed the same idea when he said : 'learning without thinking : useless ; thinking without learning : dangerous'.

I am sure from my personal observation that at its inception at any rate this Institute will be served by members blessed with wisdom as well as learning and that, in consequence, its future is bright. I would only add, if I may, one word of caution and of exhortation. I know from my own experience how, by reason of their training and of the nature of their work, men of science tend to become strongly individualistic in their outlook and impatient of any form of constraint or discipline. The success of this Institute will depend, I believe, very largely on the extent to which this very natural tendency can be held in check. No one, I am sure, need be apprehensive lest his work may suffer in freshness, originality or vigour from loyal adherence to the aims and objects of this Institute. On the contrary union is strength and inasmuch-as the boundaries of science are constantly expanding and the interdependence of the individual sciences constantly increasing, I trust that this Institute will continue to be, as I am assured it is to-day, truly representative and that its members will all derive from it strength and inspiration and a greater capacity for service. In inaugurating this first session of the National Institute of Sciences of India I wish the Institute all possible success.

Inaugural Address to the National Institute of Sciences of India

THE ORGANISATION OF SCIENTIFIC RESEARCH IN INDIA

By Dr. L. L. Fermor, O.B.E., A.R.S.M., D.Sc., F.A.S.B., F.R.S.

I. Introduction

My first duty, a duty that is also a pleasure, is to thank the Fellows of the National Institute of Sciences of India for the great honour they have done me in electing me their first President. In accepting this office I feel a heavy sense of responsibility; for in the first year of a new organisation many points have to be decided and precedents to be created that must inevitably affect the future procedure and history of the society. But you may be assured that I shall do my best to justify the trust you have placed in me.

Normally the President at the Annual General Meeting will probably think it suitable to deliver an address, of which the major theme will bear upon his own science: probably taking account also of related sciences. This, however, is not an Annual General Meeting, but an Inaugural Meeting, at which an address on my own subject, geology, would be unsuitable. Instead it is desirable to clarify our ideas about our National Institute: and this can best be done by sketching briefly the development of scientific research in India so as to show the position of our National Institute of Sciences with reference to other scientific organisations: followed by a discussion upon what our National Institute should do. On attempting to construct a continuous story, I found, however, that it would prove too long for one address; and as I am due to give a Presidential Address to the Asiatic Society of Bengal on February the 4th, and as the Asiatic Society has been the pioneer in scientific research in India, it appeared to me suitable to divide my subject into two sections and to give to the Asiatic Society the portion dealing with the development of science in India up to the end of the 19th century, discussing on the present occasion the developments in the present century leading to the foundation of this National Institute of Sciences of India. Although this course is like putting the cart before the horse it is obviously suitable in view of the dates of founding of the Asiatic Society and the National Institute respectively.

Development of science in Europe.

In the second address I refer to the birth of science during the golden age of Greece in the period 450 to 400 B.C. in Athens, to the period of darkness that descended upon the world after the break up of the Roman Empire, until the Renaissance or rebirth of learning in Europe in the 13th to 16th centuries, leading to the foundation of the Royal Society of London in 1660 and of the *Académie royale des sciences* in France in 1666. I mention particularly that the French Academy of Sciences now forms with four other Academies for other branches of learning what is now called the Institute of France, but which, at an earlier stage of its existence, had a longer title, namely *L ' Institut nationale des sciences et des arts* ', that is to say, ' The National Institute of Sciences and Arts '.

Hindu and Arab contributions.

I mention also the part played by the Hindus and the Arabs in their contributions to science during the dark ages in Europe; that Hindu science appears to be partly indigenous and pre-Greek and partly based on Greek influence; and that Arab science was built upon Greek and Hindu science.

The Asiatick Society.

I mention also that the introduction of western science and learning into India appears really to date from the arrival in Calcutta of Sir William Jones, a Puisne Judge of the Supreme Court at Fort William in Bengal in 1783, followed by the foundation in 1784 of the Asiatick Society, a society for the study of the antiquities, arts, sciences, and literature of Asia.

The Indian Museum.

I allude to the various offshoots from the activities of what is now called the Asiatic Society of Bengal in the foundation of the Royal Asiatic Society of Great Britain and Ireland, with the establishment of branches at Bombay, Madras, Colombo, and Singapore; of the foundation of the Indian Museum based on the collections of the Asiatic Society, and of the establishment of various scientific departments of the Government of India, some of which can be traced directly to the influence of the same Society.

Scientific services.

I mention also that the oldest scientific services in India appears to have been Trigonometrical Survey of the Peninsula in 1800, changed to the Great Trigonometrical Survey in 1818—now the Geodetic Branch of the Survey of India—, and the Geological Survey of India, founded in 1851. These two Departments, with the Medical Services, appear to have been the pre-mutiny, i.e. pre-Crown, scientific services of India. There were also Assay Masters at His Majesty's Mint, Calcutta, at least as early as 1792. I also mention that the oldest universities are those of Bombay, Calcutta, and Madras, all founded in 1857.

Societies.

Although by the end of the 19th century several scientific services had been formed in India and had established their own journals, memoirs, and records, yet their officers still contributed freely to the publications of the Asiatic Society of Bengal, which continued to be a great depository of the results of research in all branches of science and letters. In fact, until the end of the 19th century there were hardly any other scientific societies, not to mention scientific societies of note; but amongst them the Bombay Natural History Society, founded in 1883, held and still holds a notable place. Mention should also be made of the Indian Association for the Cultivation of Science established in Calcutta in 1876 and formerly engaged mainly in teaching, but now a research Association.

II. THE DEVELOPMENT OF SCIENTIFIC RESEARCH IN INDIA IN THE TWENTIETH CENTURY

A. *Specialist Organisations*

Specialist Societies.

In the present century we have entered on a new stage in the development of scientific research in India, a period characterised by the formation of numerous specialist scientific societies and numerous Government research institutes. In the matter of specialist scientific societies the geologists gave an early lead with the foundation of the Mining and Geological Institute of India in 1906. The Indian Mathematical Society was started in 1907 in Poona as the Indian Mathematical Club; at present the office thereof is in Nagpur, whilst the Society's Journal is published in Madras. This was followed by the Institution of Engineers (India), founded in 1921, with its headquarters in Calcutta, but with branches at several other important towns; the Indian Botanical Society, with a peripatetic headquarters, but with a journal published in Lucknow, was also founded in 1921; the Indian Chemical Society, with its headquarters in Calcutta, was founded in 1924, as also the Geological, Mining, and Metallurgical Society of India; whilst in the past year, three all-India societies have been founded in Calcutta, namely the Indian Physical Society, the Indian Society of Soil Science, and the Indian Physiological Society. There is also the Society of Biological Chemists founded at Bangalore in   and the Institution of Chemists (India) founded in Calcutta in 1927; and of societies of more restricted geographical scope, one may mention the Calcutta Mathematical Society founded in 1908.

Research Institutes.

In addition to the Government scientific services supported by funds from Central Revenues, there are also in India several research institutions similarly supported. Of these we may enumerate in chronological order of foundation the Imperial Institute of Veterinary Research at Muktesar, which commenced life as the Imperial Bacteriological Laboratory at Poona in 1890, moved to Muktesar in 1893, and assumed its present title in 1925: the Imperial Agricultural Research Institute at Pusa (1903): the Central Research Institute at Kasauli (1906): the Imperial Forest Research Institute at Dehra Dun (1906): and the All-India Institute of Public Health and Hygiene in Calcutta (1934). There are also several other well-known research institutions principally medical, provincially administered, at which high-class research work is in progress, e.g. the School of Tropical Medicine, Calcutta, and the Haffkine Institute, Bombay.

Further, there is the Indian Institute of Science at Bangalore founded in 1911 and supported mainly by private bequests supplemented by Government grants and directed to research and advanced scientific education.

The Universities.

Finally, we must mention the Universities, which, as their title indicate, may be concerned with all branches of knowledge. The oldest universities in India are those of Bombay, Calcutta, and Madras, all of which were founded in 1857, followed by the University of the Punjab in 1882 and University of Allahabad in 1887. In addition, during the present century a considerable number of additional universities have been founded. In those universities chairs of Mathematics, Chemistry, and Physics are almost universal and, in addition, most universities have chairs of Botany and Zoology, but only a small proportion of them have chairs of Geology. During the past decade much work of high quality has come from the universities, but happily the tendency is for our university friends to offer the results of their researches for publication by one of the existing scientific societies rather than for the universities to start their own journals.

B. Co-ordinating Organisations

With this multitude of new bodies—services, societies, universities, research institutes—coming continuously into being, with a resultant tendency towards greater and greater specialisation and consequent isolation of workers, there is an increasing need for organisations directed to counteracting fissiparous tendencies so as again to bring men of science and other branches of learning back to a common fold providing for a free exchange of views: a result that can be secured either on a comprehensive basis enabling the co-operation of all branches of learning, or at least of all branches of science, or upon a compartmental plan in which allied groups of sciences are brought together.

At the beginning of this century the only organisation directed to this end in a really comprehensive manner was the Asiatic Society of Bengal, to which abundant reference has already been made.

The Board of Scientific Advice.

In 1902, however, the Government of India made provision for the co-ordination of official scientific enquiry in a Board of Scientific Advice. This Board was formed in accordance with a Government of India Resolution dated 28th August, 1902, the Board consisting originally of the following officers:—

The Surveyor-General of India.
The Meteorological Reporter to the Government of India and Director-General of Observatories.
The Director, Geological Survey of India.
The Director, Botanical Survey of India.
The Superintendent, Natural Historical Section, Indian Museum (now the Director, Zoological Survey of India).
The Inspector-General of Forests.
The Inspector-General of Agriculture.
The Inspector-General, Civil Veterinary Department.
The Reporter on Economic Products to the Government of India.

In addition, the Secretary to the Government of India in the Department of Revenue and Agriculture was *ex-officio* President, whilst the Director, Botanical Survey of India, was Secretary.

This Board met periodically, discussed problems of common interest, and published an Annual Report in which the progress of research in India by Government institutions during the year was summarised subject by subject. These Annual Reports though departmental and confined, as was natural, almost entirely to work done under official auspices, were of considerable value; but the activities of the Board were suspended in 1924, and have not since been resuscitated. The reports of the Board were communicated through the Secretary of State for India to the Royal Society, who appointed an Advisory Committee to consider them, and who from time to time furnished the Board and the Government of India with valuable suggestions and advice.

There is now no official Council of Scientific Research in India dealing with science as a whole, although there are two official councils dealing with important sections of scientific research. One is the Indian Research Fund Association and the other the Imperial Council of Agricultural Research.

Indian Research Fund Association.

The Indian Research Fund Association was founded in 1911, is located in Delhi and Simla, and is in receipt of funds from the Central Government now enormously reduced as a measure of retrenchment. It is entrusted with the duty of organising medical research at several research institutes throughout India and of deciding the allocation of available funds. In this the Association takes the advice of an Annual Research Workers' Conference held in Calcutta.

Imperial Council of Agricultural Research.

The Imperial Council of Agricultural Research was formed in 1929 as a result of the Report of the Royal Commission on Agriculture, and is in receipt of a substantial annual Government grant for purposes of research in agriculture including veterinary research. The funds are allocated to agricultural and veterinary research organisations throughout India, the Council holding periodic meetings in Delhi and Simla for the purpose of determining this allocation.

The Indian Science Congress Association.

The isolation of certain scientific workers, to which I have already alluded, is partly the *geographical isolation* of those who live in places where there are but few scientists, and partly the *specialist isolation* of large numbers of scientists one from another due to their specialisation. In order to counteract to some extent both forms of isolation Prof. J. L. Simonsen of Madras and Prof. P. S. MacMahon of Lucknow, both Professors of Chemistry, proposed in 1911 the formation of an Indian Association for the Advancement of Science, analogous to the British Association. As a result, the Indian Science Congress was born, the inaugural meeting being held in 1914 in the rooms of the Asiatic Society of Bengal under the patronage of Lord Carmichael and the Presidentship of Sir Ashutosh Mookerjee. This Congress, which has since become an Association, meets annually, moving from one important city to another on a plan analogous to that adopted by the British Association, so that during 22 years, 10 different centres of research have been visited. The great success of this organisation is shown by the large numbers of scientists from all parts of India who now attend the annual sessions and the corresponding magnitude of the annual volume of published *Proceedings*. Although in its annual activities the Association is peripatetic, yet it requires a permanent office, and this, in fact, is provided in Calcutta by the Asiatic Society of Bengal, which acts as the managing body of the Congress. There can be little doubt that the Indian Science Congress has proved of very great benefit in promoting intercourse between the scientists of all parts of India and all sciences, thereby mitigating both forms of isolation. But this Association meets only once a year, and it is for one week only during 52 that scientists are afforded the opportunity for this fruitful intercourse. During the rest of the year, the centres of research tend to remain in geographical isolation one from another, and at those centres, particularly at the larger ones, the scientists return from the Congress to their specialist isolation, making use as far as possible of specialist societies.

The Academies.

There is no doubt that there is a great need for the existence, at the important centres of scientific research, of bodies in which workers in various branches gather not for the reading of specialised papers dealing with minor details and specialist problems, but for the reading and discussion of papers with broader outlines and for the interchange of views. This brings us to the Academy.

During the past year the word *Academy* has been much before us, and to many this term has appeared as a desirable fruit, so that some of the Foundation Fellows of our National Institute, and also some of those who have not yet become Fellows, have expressed their disappointment that we have selected the term *Institute* rather than the term Academy.

Meaning of the term Academy.

It seems desirable, therefore, that we should first enquire what the word Academy means. It will surprise most of you to learn that the first Academy was a pleasure garden in Athens which is supposed to have belonged to an ancient Attic hero named Academus. The garden was walled in by Hipparchus, and eventually bequeathed as a public pleasure ground by Cimon to his fellow-citizens of Athens. In this garden the Greek philosopher Plato taught for nearly 50 years; and the Academy thus started lasted from the days of Plato to those of Cicero, that is, for over 300 years.

A philosopher's garden.

We see thus that the original Academy dated from about 400 B.C. and was a garden utilised for philosophic teachings and discussions. It was essentially a place where any branch of knowledge could be discussed, and was completely different from our specialised societies of to-day. In this original Academy the old philosophers must have discussed arts and letters, mathematics, and science, as well as philosophy strictly so called; so that a true Academy, without qualification, should be on as broad a basis. The Asiatick Society, now the Asiatic Society of Bengal, is one of the few institutions that complies with such a definition, and it is essentially an Academy of arts, letters, philosophy, and sciences. Another point is that an Academy was essentially a place where philosophers could meet and discuss problems, being essentially suited for personal and local utilisation. From this aspect, therefore, an attempt to found an Academy to serve so large an area as the whole of India is probably misdirected effort, until rapid means of transport become very much cheaper than they are at present. From this consideration it seems also to follow that the promotion of the regular intercourse of the men of letters and science throughout India is only feasible in the first instance on a regional basis, so that each important region, in which there is any volume of research, should have its own Academy, preferably of both science and letters jointly, but otherwise Academies of science and letters separately. It is impossible to foresee at present what number of Academies of Science so large a country as India really needs. It will be for the scientists in different parts of India to settle this by deciding whether they prefer to walk and talk in their own gardens of philosophy, or to make use of distant gardens by means of the letter-box and the printed page.

Regional activities.

All-India activities of Academies.

The Asiatic Society of Bengal.

While Academies, if we go to the original meaning, must, therefore, function locally or regionally in the most important portion of their activities, they can also legitimately make a wider appeal; for nowadays Academies also undertake the publication for general information of the results of original researches carried out by their members, and for this reason Academies may legitimately expect to secure a wider membership than only local utility would encourage. The Asiatic Society of Bengal, originally founded as the *Asiatick Society*, with the intention of investigating within the geographical limits of Asia 'whatever is performed by man, or produced by nature', has as the result of its researches secured a membership that is not only all-India but international. Nevertheless the major benefits of its activities accrue to those who are within easy reach of its headquarters, and eventually the Society has had added to its name for purposes of identification a territorial or local designation, so that it is now called the Asiatic Society of Bengal, in the same way as *the* Royal Society is the Royal Society of London as distinct from the Royal Society of Edinburgh. In practice, however, the Asiatic Society cannot hope to cater for the frequently recurring (say monthly) needs of the whole of India and, therefore, can have no feeling of jealousy towards other bodies of Academy rank founded in other parts of India.

The United Provinces Academy of Sciences.

The United Provinces Academy of Sciences, founded at Allahabad in 1930, was, therefore, on this argument, a desirable creation to provide for the meeting of students of all branches of science in Northern India. This Academy has already secured numerous members outside the geographical limits of the United Provinces, so that its activities, like those of the Asiatic Society of Bengal, are partly local or regional and partly all-India.

Indian Academies of Sciences.

When in 1933, the proposal was mooted to found an Indian Academy of Sciences, some of us overlooked the fact that there were already two such Academies in existence,—one called the Asiatic Society of Bengal and the other the United Provinces Academy of Sciences. The proposal, therefore, to found a third Indian Academy, which was entrusted to a Committee appointed by the Indian Science Congress, logically meant either the creation of a fresh garden in another part of India, or of a body to co-ordinate the already existing gardens. Our friends in Bangalore knew all the time that they needed a Society of Academy status with its headquarters in Bangalore. Had they boldly said so at the beginning, the confusion that has arisen in scientific circles during the past year would have been avoided, because it is obviously correct that Southern India should have its own philosopher's garden. However, Bangalore did not do this, so that the general problem was entrusted to the Academy Committee appointed *ad hoc* by the Indian Science Congress. When this took place logic necessitated, though the position had then been analysed by no one, the formation of an Academy of Sciences in Southern India, and possibly of others in Western India, and the Punjab, and then the formation of a co-ordinating body for all the Academies, three, four or five in number.

The Indian Academy of Sciences, Bangalore.

Object as we may to the manner in which our Bangalore friends cut adrift and abruptly started a new Academy, their action has at least had the merit of revealing the logic of the situation, so that we can appropriately end by welcoming the Indian Academy of Sciences founded at Bangalore, and also agree that this Academy whilst providing a philosopher's garden for Southern India can legitimately have all-India aspirations and activities parallel to those already possessed by the Asiatic Society of Bengal and the United Provinces Academy of Sciences.

III. THE FORMATION OF THE NATIONAL INSTITUTE OF SCIENCES OF INDIA

The National Institute of Sciences a co-ordinating body.

But we still need a co-ordinating body; and that is why it is necessary to found the National Institute. Obviously this co-ordinating body should not compete with the Academies in such a way as to harm them. The prime function of the Academies is to arrange for regular meetings for philosophic discussions on a suitable periodic basis, say monthly, and for the regular periodic publication of the results of these meetings and discussions, in so far as they are worthy of publication to the world at large. With these activities of the Academies our National Institute should not seriously compete. Instead, our National Institute should have as one of its major activities the co-ordination of the labours of the various Academies. This may prove to be a task of some importance and magnitude, for since India is as large as Europe without Russia, so eventually, as the progress of science so justifies, it may prove desirable to found Academies of Sciences for several of the larger units of territory in India. In France, which is equivalent in size only to one province of India, there are five Academies with a headquarters in Paris.[1] These five Academies are co-ordinated in the Institute of France which, as I have already mentioned, was, in a former stage of existence, called the National Institute of Sciences and Arts. On an analogous basis one of the prime duties of our National Institute should be to co-ordinate the activities of the various Academies of Sciences in India.

We can picture that one day there may be also a *National Institute of Letters*, the purpose of which would be to co-ordinate the activities of Academies of Letters in India, in the formation of which the Asiatic Society of Bengal might appropriately take the lead. We can also picture the eventual formation of a *National Institute of Arts* co-ordinating similarly the activities of Academies of Arts in India. Once this has happened, there will be a need for co-ordinating the three National Institutes into a National Institute of Arts, Letters, and Sciences of India, which would be *the Institute of India* equivalent to the Institute of France in its comprehensive scope. For the present it is sufficient for us to found a National Institute of Sciences.

Liaison of National Institute with the Academies.

Because of the historical fact that in India our Academies have been formed before our National Institute, it follows that there is at present no organic relationship between the co-ordinating Institute and the co-operating Academies. Each of the Academies is a completely independent body and the extent to which co-ordination of their labours can be effected through the National Institute depends upon the measure of concord that is established. We have arranged, however, for an effective liaison with the three existing Academies by providing on the Council of the National Institute for an additional Vice-President and an additional Member of Council for each of the co-operating Academies to be nominated by the respective Academies. In addition also, partly because common sense requires it, and partly in acknowledgment of our debt of parentage, we are providing for an additional Vice-President and an additional Member of Council to be filled from the Executive Committee of the Indian Science Congress.

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[1] Besides Academies at smaller towns such as Montpellier and Toulouse.

Fellowship of the National Institute.

We may now, for the benefit of those who have not followed the course of the labours of the Academy, refer to the membership of our National Institute. After full discussion the Academy Committee decided that our new body should have a membership sufficiently restricted to make it a distinction to belong thereto, but at the same time not so limited as to prevent us having at our disposal a useful volume of scientific experience and ability. We decided that it would be suitable to start with 125 Foundation Fellows and to elect 10 new Fellows annually thereafter. In selecting the Foundation Fellows the Academy Committee first assigned quotas on a percentage basis to the various sciences and then appointed small sub-committees to make nominations up to the quotas for the first 100. In order to provide for rectification of inequalities and omissions, should such have occurred, the Academy Committee placed the remaining 25 names for election before those of the first 100 who had accepted Foundation Fellowship. That our methods have met with approval is shown by the fact that out of the 125 scientists invited, 113 have already accepted Foundation Fellowship, 6 only have declined, whilst three unfortunately have died, namely Prof. P. Sampat Iyengar, late Director of the Mysore Geological Department, Prof. S. R. Kashyap of Lahore, who had been nominated to be one of the Vice-Presidents of the first Council, and Professor V. Krishnamurti of Madras.

Steps have been taken to fill the definite vacancies amongst the Foundation Fellows. Such vacancies as still exist it is proposed to fill during the first year in addition to the annual allotment of ten.

Our Foundation Fellows are distributed throughout the length and breadth of India and include representatives of every branch of science. They include all the Fellows of the Royal Society resident in India, all the past-Presidents of the Indian Science Congress resident in India but one, almost all the heads of the Government of India scientific departments and research institutes, and many distinguished occupants of University professorial chairs throughout India. Although a large proportion of our Fellows are engaged either in teaching or in the pursuit of pure science, yet we have the requisite number of practical men, men whose interests lie in applied science, engineering, and industrial research. The majority of our Fellows belong in addition to one or more of the co-operating Academies, and it may be hoped that as many as possible of our Fellows will think it desirable to belong to the Academy that they can most conveniently treat as their own philosopher's garden.

The Council of the National Institute.

In framing our Council we found necessary the large number of 25 in order that after allotting to the headquarters station sufficient members to ensure the possibility of always being able to secure a quorum, we should also be able to have Members of Council in as many of the important centres of scientific research in India as possible. We hope in this way that our Fellows in all parts of India will be kept in touch with the doings of our Council, because it is our intention that the minutes of the Council Meetings shall be sent by post to all Members of Council wherever they are. In addition to these 25 Members of Council representing the National Institute, we have, as already mentioned, made provision for each of the three co-operating Academies, as well as the Indian Science Congress Association, to be represented by an additional Vice-President and an additional Member of Council, selected by the Academy from amongst our Fellows who are members of the respective organisations. Should any other Academies of requisite status be formed, we shall be prepared to allocate the same representation of an additional Vice-President and an additional Member of Council, provided, of course, that such Academies contain the requisite minimum number of our Fellows amongst their membership. In all cases the representatives appointed by co-operating bodies must be Fellows of our National Institute.

Additional Vice-Presidents and Members of Council

IV. THE FUNCTIONS OF THE NATIONAL INSTITUTE OF SCIENCES

You will now ask what the National Institute proposes to do. Before answering this question I wish to retrace my steps a little. I have mentioned that in Europe each important country has its own Academy of Sciences. These countries being, however, independent countries have no body that can be regarded as the equivalent to our National Institute directed towards co-ordinating the efforts of the Academies of different countries. This want has been long felt in Europe and eventually led to the formation in 1918-19 of the body called the International Research Council, which is a Council for Science not only in Europe, but throughout the world, with its headquarters in Brussels. This International Research Council operates through National Research Councils, and every important country in Europe as well as in America has its National Research Council; and it is through the National Research Councils of Europe, co-operating with the International Research Council, that the efforts of scientists in different countries are co-ordinated. It is obvious from these remarks that one of the functions of our National Institute should be to act as the organising body of a National Research Council in India.

National Research Council.

In 1926 the Surveyor-General made a proposal to the Government of India that India should join the International Research Council and certain International Unions formed under the auspices of the Council. This led to a request from Government for further information on the proposal, and eventually in 1930 the Government of India announced that it had been decided that India should join the International Research Council and its Unions of (1) Geodesy and Geophysics, (2) Geography, (3) Astronomy, (4) Biological Sciences, and (5) Radio-Telegraphy. At the time, in the absence of any representative scientific organisation in India that could itself join the Council and arrange for collaboration with the five Unions mentioned, the Government of India were compelled themselves to join this Council, but they were informed that if possible adherence to the Council and Unions should be entrusted to a national scientific organisation, and that other countries had joined through existing scientific academies and institutions, or had set up special scientific bodies for that purpose. The general feeling of the Members of the International Research Council was that the Government of India should not be a member longer than was necessary, lest a political element might be introduced. The Government of India did not consider that any such result need be apprehended from their membership of these organisations, but they wished to assimilate India's position in relation to these bodies, should this be feasible. Accordingly, the Government of India asked the Surveyor-General for advice on this question and requested that he should submit his views after consulting the heads of other scientific departments. In the end, a Committee consisting of the Surveyor-General and the Directors of the Botanical, Geological, and Zoological Surveys considered the various problems in committee and submitted a joint report to Government. This Committee reported that there was in India no body comparable to the Royal Society of London, suitable to undertake the organisation of such a National Research Council, and that, meanwhile, it was desirable to form a Council under Government ægis, with the expenditure connected therewith to be borne by Government. We made definite proposals for the constitution of the Council and of the National Committees for various subjects. Soon after the submission of our report the financial condition deteriorated and no action has been taken in the direction of forming a National Research Council.[1]

When in 1932 the Editorial Board of *Current Science* attempted to elicit the opinion of scientists in India concerning the desirability of forming an Academy of Sciences, I personally replied to the effect that I did not see the need of a new Society for the purpose of reading papers, but that there was a need for a body of scientists of position to render possible the formation of a National Research Council in India, and for this reason I supported the proposal. We had not then realised the full logic of the proposition. But now, in founding this National Institute of Sciences, we have gone a long way towards making it easy for India to form a National Research Council with National Committees in various sciences co-operating with the International Research Council and the International Research Unions; and this we may regard as one of the justifications for the formation of our National Institute.

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[1] I may mention that the Government of India also consulted various non-official scientific bodies on this problem.

The co-ordination of labours of men of science.

Coming now to the question of the aims and objects of our National Institute, these have already been defined in a note issued with the Academy Committee's report. These, as you know, are substantially the same as the aims and objects that were placed before the Academy Committee as a result of the series of resolutions passed by the General Committee of the Indian Science Congress in Bombay in 1934. In my opinion the most important of our objects are to be prepared to co-ordinate the labours of the scientists in India, to effect co-operation between the various bodies of Academy rank, and to render possible the formation of a National Research Council.

Meetings of the National Institute.

In my view our Institute does not exist primarily for the purpose of reading papers, so that we shall not need to hold regular monthly meetings. We have suggested that to begin with two general meetings in the year for business purposes will suit our purposes. One of these will be held at the city where the Indian Science Congress meets, so as to render possible the largest attendance of Fellows. The other will be held at the city selected for the business headquarters of the Institute. As due notice will be given of each of these meetings, and as in consequence we shall expect to secure the attendance of a large number of the leading scientists of India, we shall, of course, utilise the opportunity to read and discuss papers of general interest and outstanding merit. We do propose, therefore, on these occasions to give an opportunity to scientists to read papers, and we have, as you know, several papers of high quality offered for reading at the first Ordinary General Meeting of this Institute to be held to-morrow.

An annual review of the progress of science in India.

In addition, we propose to resuscitate in a different form the labours of the Board of Scientific Advice by publishing annually a review of the progress of science in India. Our reviews will, however, differ from those published by the Board of Scientific Advice, in that they will take account not only of the labours of scientists employed in Government services, but also of unofficial scientists throughout India.

Consolidated *Comptes rendus* or *Proceedings* of Academies.

Another matter that is of serious concern to scientists is the increasing number of new scientific journals, so that it is becoming increasingly difficult for any worker in science to keep up with the progress in the branch of science in which he is more particularly interested. From the point of view of a scientist in a particular science, specialist journals are the most convenient, and to this extent those published by bodies of Academy status must be regarded as a source of inconvenience, in that they contain papers on all branches of science that might have been allocated to the respective specialist societies. We all agree, however, that such specialist distribution carried to completion is undesirable, and that in order to facilitate intercourse between men of different sciences, bodies of the Academy type are necessary. It is obvious, therefore, that we require some means by which the productions of all the Academies may be made conveniently accessible to all workers of science in India. For this reason it has been agreed that one of the duties of the National Institute will be to issue a consolidated *Comptes rendus* or *Proceedings* containing summaries of the papers read before all the three co-operating Academies. I can imagine that later it may be asked why we confine our activities to papers read before Academies only, and I can foresee as a development that eventually it may prove desirable to include also summaries of papers published in specialist scientific societies, and in this way to produce a consolidated *Comptes rendus* of all papers read before both Academies and specialist societies in India.

Symposia.

Although normally scientific research is severely specialised, so that scientists tend to work in water-tight compartments, yet every science has its borders where it touches one or more other sciences, so that there are fruitful fields or, shall we say, gardens, of possible co-operation along these boundaries. It is, therefore, sometimes suitable and desirable to promote special meetings for the purpose of arranging discussions, by scientists of allied sciences, of problems of joint interest. These discussions are usually known as *symposia* (literally *drinkings together*) and it has been agreed that the arrangement of symposia may be regarded as one of the functions of the National Institute

A reservoir of scientific knowledge and experience.

Another aim of our Institute is to provide a reservoir of knowledge and experience in all branches of science available for application to the study of scientific problems connected with the general welfare of the country. We have not yet worked out our machinery for this; but one possibility is that we may group our Fellows into Committees according to their sciences and that to such Committees the Council will refer special problems for their advice. This means that should Government or any other organisation require advice upon problems of scientific interest, they will be able to rely upon securing the best opinion available in India.

Liaison with Letters.

You will remember that in accordance with the resolutions passed in Bombay last January one of our purposes should be 'to promote and maintain a liaison between men of science and men of letters'. The Academy Committee decided during the year that our first task must be to found an organisation devised specifically to suit the needs of scientists and that the question of providing for this liaison with letters must be left for the future. You will, I hope, all agree with me on the great desirability of ultimately effecting such a liaison, which would be brought about ultimately if my vision of National Institutes of Arts and Letters co-operating with our National Institute of Sciences of India should come true. For the present we may consider that the desired liaison has been effected in an indirect way by the fact that one of the Academies co-operating with the National Institute, namely the Asiatic Society, is an Academy both of sciences and of letters.

Management of funds for scientific research.

The fifth purpose for which a new organisation was desirable was to 'secure and manage funds and endowments for scientific research'. Upon this point I now wish to speak. Since we have decided upon a limited Fellowship and have also made our subscriptions moderate, it follows that the income derived from Fellows' subscriptions alone will not be sufficient to enable the National Institute to carry out in full the purposes for which it has been founded. We hope, therefore, that the Government of India, and perhaps the provincial Governments, will prove to be in sympathy with the aims and objects of our Institute and that they will realise that this organisation has been founded for the general benefit of science in India, and that, consequently, they will be prepared to contribute towards our financial resources. Apart from the funds required for the continuously recurring needs of the National Institute, we shall also be prepared to administer funds presented by men of wealth and position either in aid of the general business of the National Institute, or for the endowment of specific items or branches of research; and the Treasurer will be very glad to receive any donation, however large or however small, either towards the general funds of the Institute, or specifically designated for particular purposes. It is desirable that, as far as possible, contributions should be to the general funds until the finances of the Institute have been placed on a secure footing.

Choice of headquarters of the National Institute.

The next point to mention is the choice of the headquarters of our National Institute. This question has been the cause of much discussion, and as long as the position of the new organisation with reference to existing societies was not clearly defined or understood there was bound to be jealousy and anxiety on this point. Past history and present facts point obviously to Calcutta. But had our new society been another Academy in the sense used in this address, I should not have advocated the selection of Calcutta as its headquarters, for there is no room for two Academies of similar aims in one city. Another possibility, and one which was briefly considered, was that of establishing the headquarters of the new body at Delhi, the official capital of India. The total number of scientists resident at Delhi, however, seemed to render this undesirable. The third possibility was an amalgamation with the newly established Academy of Sciences at Bangalore; but this became clearly inadvisable once it was realised that there were already two other Academies of Sciences in India with claims prior to those of the Academy founded at Bangalore. The fourth possibility was for the National Institute to function as a peripatetic body with its headquarters moving every two years according to the change of President. This possibility was considered, but the Academy Committee decided that business requirements and the best interests of the Institute necessitated that the headquarters should be located definitely in one particular centre of research. Our provisional rules do not name any place as the headquarters and there is nothing in them to prevent a change of headquarters at any time should the interests of the National Institute render this desirable. Meanwhile convenience and common sense appeared to require that we should, to begin with, locate the office of the Institute in Calcutta. Once concord had been established with Bangalore Sir C. V. Raman himself suggested that this was obviously the logical and correct course to follow. We have accordingly decided to start in Calcutta, but in accordance with the statement made to our Foundation Fellows in our note on the aims and objects of the National Institute, we propose during the first year to take the opinion of our Fellows on this point. If they confirm that the Academy Committee is correct in selecting Calcutta as headquarters they will make a decision in accordance with the course of scientific development in India, recognising that although the Government of India has moved from Calcutta to Delhi, yet it has left behind in Calcutta the headquarters of several of its scientific services, and that on this account, and because of the size of Calcutta with its numerous other scientific institutions, Calcutta is by far the largest centre of scientific research in India. For the present, at least, it appears that it is in the best interest of science that the National Institute should commence work in Calcutta.

As we have decided to make a commencement in Calcutta the Asiatic Society of Bengal has generously offered to provide us with office accommodation ; and also to permit us to meet in Council and to hold ordinary meetings of our National Institute as necessary in the rooms of the Asiatic Society of Bengal. In making this offer the Asiatic Society preserves its traditional position as the mother of the development of science in India. We hope also that the Government of India will assume towards our National Institute its traditional position as father by providing suitable funds. For I hope you have realised from my address that the Asiatic Society of Bengal and the Government of India between them are the mother and father of the development of scientific research in India.

V. CONCLUSION

It is now appropriate that I should on behalf of the National Institute thank His Excellency Sir John Anderson, the Governor of Bengal, for honouring us with his presence here to-day and for inaugurating our National Institute. It is well known to many of you that Sir John Anderson had a scientific training, and it is clear that had he not devoted his great abilities to administration and had he instead embarked upon the normal career of a worker in science he must have attained to a position of high distinction in the scientific world. It is very appropriate, and we are very fortunate, that our National Institute has been inaugurated by an administrator of scientific training. The date selected for our Inaugural Meeting has proved too late to render possible the presence of members of the Government of India, but I have received personally friendly messages of good wishes for the success of our National Institute from Sir Fazl-i-Husain, Sir Frank Noyce, and Sir James Grigg. I have also received expressions of good will from three of our most senior Fellows, namely Sir J. C. Bose, Sir P. C. Ray, and Sir Martin Forster.

In opening this address I expressed my appreciation of the great honour done to me in asking me to be the first President of the National Institute. In this address I have reviewed the development of science in India during the present century starting really with the formation of the Board of Scientific Advice in 1902. As I myself arrived in India in the same year my long service has coincided with the developments discussed in this address. My service is now rapidly approaching its completion, and I take, therefore, this opportunity to say how glad I am to have served in India long enough to take part in the foundation of this National Institute, an organisation that appears to me the logical outcome of the attempts during this century to bring men of all sciences back to a common fold, in counteraction to the fissiparous tendencies caused by the general advancement of science in India, with the resultant formation of so many new bodies—services, societies, universities, and research institutes—devoted to the specialised study of science. Indeed, I hope that in the future, sooner or later, you will succeed in bringing about an effective liaison between science and letters and if, as seems logical, your Fellows decide to confirm Calcutta as the headquarters of our National Institute, and to accept the friendly offer of the Asiatic Society of Bengal, I can picture that one day when National Institutes for Arts and Letters have also been founded, the historic and beautiful building, No. 1, Park Street, which will in any case eventually need rebuilding, will be replaced by a more commodious and comprehensive edifice designed to house not only the Asiatic Society of Bengal, but also the National Institute of Arts, Science, and Letters, with accommodation also for All-India Societies either of Arts, Letters, or Science, the headquarters of which are in Calcutta, and forming thus a magnificent palace of learning in Calcutta equivalent to Burlington House in London. This, I know, is a vision; but because the vision is both logical and possible of fulfilment, it shows that the design of our National Institute of Sciences is on the right lines and that the position allocated to our Institute in the scheme of scientific things in India is the correct one.

Council of the National Institute of Sciences of India for 1935

President :—

Dr. L. L. Fermor, O.B.E., D.Sc. (Lond.), A.R.S.M., M.Inst.M.M., F.G.S., F.R.S., F.A.S.B., Director, Geological Survey of India, Indian Museum, Calcutta.

Vice-Presidents :—

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Prof. M. N. Saha, D.Sc., F.R.S., F.A.S.B., Professor of Physics, Allahabad University, Allahabad

Secretaries :—

Prof. Dr. S. P. Agharkar, M.A. (Bom.), Ph.D. (Berol.) F.L.S. (Lond.), Ghose Professor of Botany, Calcutta University. 35, Ballygunge Circular Road, Calcutta.

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Mr. T. P. Bhaskara Shastri, M.A., F.R.A.S., Director, Nizamiah Observatory, Begumpet, Hyderabad, Deccan.

Dr. S. S. Bhatnagar, D.Sc., University Professor of Chemistry, Director, University Chemical Laboratories, Lahore.

Mr. B. C. Burt, C.I.E., M.B.E., B.Sc., I.A.S., Agricultural Expert, Imperial Council of Agricultural Research, New Delhi (& Simla).

Prof. Ganesh Prasad, M.A., D.Sc., Hardinge Professor of Higher Mathematics, Calcutta University, 2, Samavaya Mansions, Corporation Street, Calcutta. (Since deceased.)

Prof. J. C. Ghosh, D.Sc., Head of the Department of Chemistry, Dacca University, Ramna, Dacca.

Dr. F. H. Gravely, D.Sc., F.A.S.B., Superintendent, Government Museum, Museum House, Egmore, Madras.

Lt.-Col. R. Knowles, B.A., M.R.C.S., L.R.C.P., F.A.S.B., I.M.S., Professor of Protozoology, School of Tropical Medicine, Calcutta.

Dr. K. S. Krishnan, D.Sc., Mahendralal Sircar Professor of Physics, Indian Association for the Cultivation of Science, 210, Bow Bazar Street, Calcutta.

Prof. S. K. Mitra, D.Sc. (Cal. & Paris), Ghose Professor of Physics, Calcutta University, University College of Science, 92, Upper Circular Road, Calcutta.

Prof. J. N. Mukherjee, D.Sc. (Lond.), F.C.S., Khaira Professor of Chemistry, University College of Science, 92, Upper Circular Road, Calcutta.

Dr. C. W. B. Normand, M.A., D.Sc., Director-General of Observatories, Meteorological Office, Poona 5.

Sir C. V. Raman, Kt., M.A., D.Sc., Ph.D., LL.D., F.R.S., F.A.S.B., N.L., Director, Indian Institute of Science, Bangalore.

Lt.-Col. S. S. Sokhey, M.A., M.D., D.Ph., I.M.S., Director, Haffkine Institute, Parel, Bombay.

Lt.-Col. J. Taylor, D.S.O., M.D., D.P.H., I.M.S., Director, Central Research Institute, Kasauli (Simla Hills).

Mr. C. G. Trevor, C.I.E.. President, Imperial Forest Research Institute, Dehra Dun.

Mr. F. Ware, F R.C.V.S , I.V.S , Director, Imperial Institute of Veterinary Research, Muktesar.

Representatives of the Asiatic Society of Bengal

Additional Vice-President :—

Sir U. N. Brahmachari, Kt., Rai Bahadur, M.A , M.D., Ph.D., F.A.S.B., K.I.H., Physician, Medical College Hospital (Retired), Calcutta.

Additional Member of Council :—

Mr. C. C. Calder, B.Sc. (Agri.), F.L.S., Director, Botanical Survey of India, and Superintendent, Royal Botanic Gardens, Sibpur, Howrah.

Representatives of the U.P. Academy of Sciences

Additional Vice-President :—

Prof. K. N. Bahl, D.Sc., D.Phil., Professor of Zoology, Lucknow University, Lucknow.

Additional Member of Council :—

Prof. A. C. Banerji, M.A. (Cantab.), M.Sc., F.R.A.S., I.E.S., Professor of Mathematics, Allahabad University, Allahabad.

Representatives of the Indian Academy of Sciences

Additional Vice-President :—

Prof. B. K. Singh, M.A., Sc.D., F.I.C., I.E.S., Professor of Chemistry, Ravenshaw College, Cuttack.

Additional Member of Council :—

Dr. K. V. A. Krishnan, M.B.B.S., L.R.C.P., D.B., Bacteriological Research Officer, School of Tropical Medicine, Calcutta.

Representatives of the Indian Science Congress Association

Additional Vice-President :—

Dr. J. H. Hutton, C.I.E., M.A., D.Sc., F.A S.B., I.C.S., Deputy Commissioner, Naga Hills, Kohima, Assam.

Additional Member of Council :—

Mr. W. D. West, M.A. (Cantab.), Assistant Superintendent, Geological Survey of India, Indian Museum, Calcutta.

Report to the General Committee of the Indian Science Congress Association of the Academy Committee appointed on the 3rd January, 1934 *

A detailed history of the movement for the foundation of an Indian Academy of Sciences was given a year ago in a pamphlet prepared by Prof. S. P. Agharkar, one of the General Secretaries of the Indian Science Congress Association. Copies of this pamphlet were distributed at the last Bombay session of the Indian Science Congress to all the members of the General Committee before the special meeting held on the 3rd January, 1934, to consider the proposals for the foundation of an Indian Academy of Sciences. It appears, nevertheless, necessary to include in the present report a short summary explaining the genesis of the movement and the further evolution thereof, resulting in the appointment of a Committee (hereinafter referred to as the 'Academy Committee') to frame a constitution for the proposed Academy.

In the autumn of 1911 Prof. P. S. MacMahon of Canning College, Lucknow, and Prof. J. L. Simonsen of the Presidency College, Madras, brought forward a proposal for the foundation of an Indian Association for the Advancement of Science. Its object and scope 'were stated to be similar to those of the British Association for the Advancement of Science, namely, to give a stronger impulse and a more systematic direction to scientific enquiry, to promote the intercourse of Societies and individuals interested in science in different parts of the country, to obtain a more general attention to the objects of Pure and Applied Science, and the removal of any disadvantages of a public kind which may impede its progress'.' The proposal was widely circulated among persons of culture in this country and the scholars approached were not slow to recognise the desirability of the co-ordination of scientific work and of co-operation amongst scientific workers. As a result the first session of the Indian Science Congress was held in Calcutta on the 15th to 17th January, 1914, with the late Hon'ble Justice Sir Ashutosh Mukherjee as its first President.

The proposals for the formation of an Indian Academy of Sciences have followed lines similar to those that led to the foundation of its sponsor, the Indian Science Congress Association.

Towards the end of 1930, the Government of India addressed a letter to the Provincial Governments, Scientific Departments, Learned Societies, Universities and the Indian Science Congress on the subject of the formation in India of a National Research Council and National Committees to

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* This report was adopted by the General Committee of the Indian Science Congress Association at the meeting held on the 4th January, 1935.

adhere to and co-operate with the International Research Council and certain affiliated unions respectively. Replies embodying detailed proposals were sent to the Government of India by various bodies, but apparently the financial stringency which supervened soon after prevented any action being taken thereon.

In 1930, also, the scientists of the United Provinces of Agra and Oudh formed themselves into a Provincial Academy, with the idea of affiliating themselves to an All-India Academy when formed.

In May 1933 an editorial was published in *Current Science* * giving an outline of the views of its editors regarding the formation of an Indian Academy of Sciences. In September of the same year, the Board of Editorial Co-operators of *Current Science* issued a questionnaire on the subject and invited the opinions of the scientists of India. The scientists of Calcutta who jointly considered the questionnaire in several meetings adopted certain resolutions, and in view of the accepted position of the Indian Science Congress Association as an All-India scientific body made a formal request that all proposals regarding the proposed Academy should be included in the agenda of the General Committee of the Indian Science Congress for discussion at its Bombay session.

In his Presidential Address at the Bombay session of the Indian Science Congress, Prof. Meghnad Saha referred in detail to the proposal to form an Indian Academy of Sciences and suggested a scheme for its formation on the model of the Royal Society of London. The whole question was thereafter discussed in a special meeting of the General Committee of the Indian Science Congress Association on the 3rd of January, 1934, when the following resolutions were passed:—

Resolution 1.—The General Committee of the Indian Science Congress thank the Editorial Board of *Current Science* for the excellent spade-work in sounding scientific opinion in India on the desirability or otherwise of having an Indian Academy of Sciences and proposing to hand over to the General Committee of the Indian Science Congress the material hitherto collected.

Resolution 2.—In the opinion of the General Committee of the Indian Science Congress, the principal purposes for which an Indian Academy of Sciences is desirable are:—

(i) To act as a co-ordinating body between scientific societies in India, institutions, and Government scientific departments and services.

(ii) To act as a body of scientists of eminence to promote and safeguard the interests of scientists in India and also to act as a National Research Council.

(iii) To publish a *Comptes rendus* of papers read before the Academy and also Memoirs and Transactions.

(iv) To promote and maintain a liaison between men of science and men of letters.

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* The journal *Current Science* was itself founded as a result of resolutions passed at a special meeting held during the session of the Indian Science Congress Association in Bangalore in January 1931. This journal is regarded as representative of the interests of the whole of India, and in view of its parentage has been in receipt of an annual donation from the funds of the Indian Science Congress Association.

(v) To secure and manage funds and endowments for scientific research.

(vi) To do such other things as may be necessary for the promotion of sciences in India.

Resolution 3.—Resolved that a committee be appointed to meet at an early date in Calcutta, with the object of drafting a constitution to be laid before the next meeting of the Indian Science Congress, and to take necessary steps for bringing the Academy into existence. The date suggested for the first meeting of the Committee is the 18th January to 21st January, 1934. (Date changed to 11th and 12th February, 1934.)

Resolution 4.—The Committee shall be constituted as follows :—

I. The outgoing and incoming Presidents of the Indian Science Congress.

II. One representative each of the following Societies :—

- (i) Asiatic Society of Bengal.
- (ii) Indian Chemical Society.
- (iii) Indian Botanical Society.
- (iv) Mining and Geological Institute, jointly with the Geological, Mining, and Metallurgical Society.
- (v) Indian Mathematical Society
- (vi) Calcutta Mathematical Society } *One joint representative.*
- (vii) Benares Mathematical Society
- (viii) United Provinces Academy of Sciences.
- (ix) Indian Association for the Cultivation of Science, Calcutta.

III. Director or a representative nominated by the following All-India Government Departments :—

- (i) Botanical Survey of India
- (ii) Geological Survey of India.
- (iii) Zoological Survey of India.
- (iv) Survey of India.
- (v) Meteorological Department.
- (vi) Imperial Institute of Agricultural Research. } *One joint representative.*
- (vii) Imperial Forest Research Institute
- (viii) Indian Research Fund Association.
- (ix) Imperial Institute of Veterinary Research.

IV. Director or a representative of the Indian Institute of Science, Bangalore

V. The following five members to represent the General Committee of the Indian Science Congress :—

Prof. S. N. Bose	Dacca.
Mr. D. N. Wadia	Calcutta.
Dr. S. K. Mukerji	Lucknow.
Dr. K. G. Naik	Baroda.
Dr. H. K. Sen	Calcutta.

VI. One representative of the Editorial Board, *Current Science*, Bangalore.

The Committee has power to co-opt additional members as required.

***Resolution* 5.—Prof. Meghnad Saha, F.R.S., and Prof. S. P. Agharkar be appointed Organising Secretaries.**

The Academy Committee formed in accordance with these resolutions consisted of the following :—

I. Dr. J. H. Hutton .... President, 22nd Ind. Sc. Congress, for 1934-35.
Prof. M. N. Saha .... President, 21st Ind. Sc. Congress, for 1933-34.

II. Representatives of the following Societies :—

(i)	Asiatic Society of Bengal	Dr. L. L. Fermor.
(ii)	Indian Chemical Society	Prof. J. N. Mukherji.
(iii)	Indian Botanical Society	Prof. P. Parija.
(iv)	Mining and Geological Institute and the Mining, Geological and Metallurgical Society.	Dr. M. S. Krishnan.
(v)	Indian Mathematical Society	Dr. Ganesh Prasad.
(vi)	Benares Mathematical Society	
(vii)	Calcutta Mathematical Society	
(viii)	U.P. Academy of Sciences	Prof. A C. Banerji.
(ix)	Indian Association for the Cultivation of Science.	Dr. K. S. Krishnan.

III. Representatives of the All-India Government Departments :—

(i)	Botanical Survey of India	Mr. C. C. Calder.
(ii)	Geological Survey of India ..	Dr. A. M. Heron.
(iii)	Zoological Survey of India	Dr. Baini Prashad.
(iv)	Survey of India	Brigadier H. J. Couchman.
(v)	Meteorological Department	Dr. C. W. B. Normand.
(vi)	Imperial Institute of Agricultural Research	Mr. L. N. Seaman.
(vii)	Imperial Forest Research Institute	
(viii)	Indian Research Fund Association ..	Lt.-Col A. D Stewart.
(ix)	Imperial Institute of Veterinary Research ..	No representative was nominated.

IV. Director or a representative of the Indian Institute of Science, Bangalore :—
Sir C. V. Raman.

V. General Committee of the Indian Science Congress Association :—
Prof. S. N. Bose.
Mr. D. N. Wadia.
Dr. S. K. Mukerji (since deceased).
Dr. K. G. Naik.
Dr. H. K. Sen.

VI. Representative of the Editorial Board of *Current Science* :—
Prof. C. R. Narayan Rao

VII. Organising Secretaries :—
Prof. M. N. Saha
Prof. S. P. Agharkar.

The following persons were co-opted members of the Academy Committee from time to time :—

I. Representatives of the following Societies were co-opted at the meeting held on the 11th and 12th February, 1934 :—

Indian Mathematical Society : Prof. Belekar (Nagpur). 1934.

South Indian Science Association : Dr. Subba Rao, Bangalore; resigned on 12-4-34. Prof. Venkatesachar was nominated in his place on 15-9-34.

Society of Biological Chemists, India : Dr. Gilbert Fowler, Bangalore.

Institution of Chemists, India : Dr. E. Spencer, Calcutta.

Institution of Engineers, India : Mr. A. C. Austin, Calcutta.

The following were co-opted in their personal capacities :—

Mr. M. Afzal Husain, Lyallpur.

Dr. Muzaffaruddin Qureishi, Hyderabad, Deccan.

II. The following were co-opted as members at the 2nd meeting of the Academy Committee held on the 14th and 15th April, 1934:—

Sr. T. Vijayaraghavacharya, Kt., Delhi-Simla.
Prof. S. S. Bhatnagar.
Dr. S. Tirumurti, Vizagapatam.
Principal C. A. King, Benares.
Dr. R. Row, Bombay.

III. Mr. B. C. Burt, New Delhi, was co-opted member at the 3rd meeting of the Academy Committee held on 28th and 29th June, 1934.

IV. Prof. B. Sahni, Lucknow, was co-opted a member at the 6th meeting of the Academy Committee, held on 3rd November, 1934.

The Committee regret the loss of Dr. S. K. Mukerji, who died on the 5th August, 1934.

MEETINGS OF THE ACADEMY COMMITTEE were held as follows:—

1st Meeting at Calcutta on the 11th and 12th February, 1934.
2nd Meeting at Calcutta on the 14th and 15th April, 1934.
Emergency Meeting of the Calcutta Members on the 8th May, 1934.
3rd Meeting at Simla on the 28th and 29th June, 1934.
4th ,, at Calcutta on 11th August, 1934.
5th ,, ,, on 15th and 16th September, 1934.
6th ,, ,, on 3rd and 4th November, 1934.
7th ,, ,, on 24th November, 1934.

At the first meeting of the Committee the question of procedure was first considered.

In this connection it was pointed out that Resolution 2 of the General Committee of the Indian Science Congress described in general the purposes for which the Academy was to be founded and in a way indicated the type of constitution to be devised.

It was also pointed out that according to the analysis of the replies received to the questionnaire on the subject of an Academy of Science for India, which had been sent to the Members of the Board of Editorial Co-operators of *Current Science*, the majority of the scientists who expressed their views on the subject, 'approved of the idea of seeking State aid to start an entirely new organisation which would be run more or less along the *lines of the Royal Society of London*, the details of the constitution as also the process of initiation of the Academy to be decided by a Committee to be appointed for the purpose'.

In view of the above, it was resolved that the proposed Academy should have only one class of Members to be called 'Fellows', and that their number should be restricted.

It was further resolved first to fix the number of Foundation Fellows for the proposed Academy and their distribution among the various science groups and then to consider the constitution. It was thought further that in any case the constitution would have to be approved by the proposed Foundation Fellows before it could be put forward before the General Committee of the Indian Science Congress Association for endorsement.

It was decided to fix the number of Foundation Fellows at one hundred, distributed among the various sciences, as follows :—

1.	*Mathematics and Astronomy*	9
2.	*Physics and Meteorology*	15
3.	*Chemistry including Metallurgy*	16
4.	*Medical and Veterinary Research including Experimental Psychology*	16
5.	*Zoology and Anthropology*	8
6.	*Botany*	8
7.	*Agriculture and Forest Research*	8
8.	*Geology and Geodesy*	8
9.	*Engineering*	6
10.	*Unattached*	6
	TOTAL ..	100

It was further resolved that though the initial membership of the Academy should be one hundred, 25 persons be elected annually to be Fellows in the first two years, and ten persons annually thereafter.

The procedure for the nomination of the Foundation Fellows for the various science groups was then considered and it was resolved that Sub-Committees for the different subjects be appointed consisting of the members mentioned below and that the Sub-Committees be requested to nominate the required number of Fellows up to the quota agreed upon.

It was resolved to give the following instructions to the Members of the Sub-Committees :—

> 'Persons nominated as Members of the Sub-Committee must include themselves in the list, must include all past Presidents of the Indian Science Congress belonging to that Section, and then choose from the past Sectional Presidents of the Indian Science Congress and any other eminent scientists who have not been Sectional Presidents.'

The list of Members of the Sub-Committees is given below :—

Physics and Meteorology ..	Sir C. V. Raman, Prof. M. N. Saha, and Dr. C. W. B. Normand.
Chemistry	Sir P. C. Ray, Sir M. O. Forster, and Prof. J. C. Ghosh.
Geology	Dr. L. L. Fermor, Mr. D. N. Wadia, and Mr. Pinfold.
Botany	Prof. S. R. Kashyap, Prof. B. Sahni, Prof. Agharkar, Prof. Parija, and Prof. M. O. P. Iyengar.
Zoology and Anthropology	Dr. B. Prashad, Dr. J. H. Hutton, Dr. G. Matthai, and Dr. B. S. Guha.
Engineering	Sir M. Visweshwaraya, Mr. Ash, and Dr. Penman.

Agriculture and Forest Research.	Mr. B. C. Burt, Mr. H. G. Champion, and R.B. T. S. Venkataraman.
Medical and Veterinary Research and Psychology.	Lt.-Col. J. Taylor, Lt.-Col. R. N. Chopra, Sir U. N. Brahmachari, and Mr. F. Ware.
Mathematics and Astronomy	Prof. Ganesh Prasad, Brigadier H. J. Couchman, Prof. N. R. Sen.

[At the 6th Meeting of the Academy Committee the Sub-Committees for Zoology and Anthropology and Engineering were reconstituted as follows :—

Zoology and Anthropology	Dr. B. Prashad, Dr. J. H. Hutton, Dr. G. Matthai, and R.B. L. K. Anantha Krishna Iyer.
Engineering	Dr. A. Jardine, Principal C. A. King, and Principal F. N. Mowdawalla.]

It was resolved to defer the consideration of the location of the Headquarters of the Academy to a later stage.

A part of the draft rules were considered and it was resolved to postpone consideration of the rest to the second meeting of the Committee to be held on the 14th and 15th April, 1934.

Before this second meeting of the Academy Committee, however, an unfortunate complication arose in the work of the Committee as a result of the Presidential Address of Sir C. V. Raman to a Conference of South Indian scientists at Bangalore on the 1st of April. In this address Sir C. V. Raman criticised adversely the work of the Academy Committee as revealed by the draft minutes of the first meeting, a copy of which had been sent to him as one of the members of the Committee. These minutes thus formed the basis of discussion in the Conference of South Indian scientists, which passed a number of resolutions thereon leading to a press controversy against the work of the Academy Committee. Subsequently Sir C. V. Raman and Dr. Subba Rao, who had been nominated as representatives on the Academy Committee of the Indian Institute of Science, Bangalore, and South Indian Science Association respectively, sent in their resignations of the membership of the Committee.

The second meeting of the Academy Committee was almost entirely devoted to a consideration of the situation thus created, and it was resolved to communicate to Sir C. V. Raman the Committee's observations on the resolutions of the Bangalore Conference, and to request him and Dr. Subba Rao to withdraw their resignations. It was also decided to issue a press communiqué to clarify the misunderstanding and give the scientific public an idea of the work of the Academy Committee. The Committee's observations were communicated to Sir C. V. Raman in a letter dated 16th of April, 1934, to which no reply has been received.

The registration of a society called 'The Indian Academy of Sciences' at Bangalore was announced in the press on the 30th of April, and a large number of scientists all over the country simultaneously received circular letters inviting them to become Fellows of this Academy, which was stated to have been founded on ' federal lines '.

In view of the above situation an emergency meeting of the Calcutta members of the Academy Committee was held on the 8th of May, 1934, and a Sub-Committee consisting of Dr. B. Prashad, Dr. J. N. Mookherjee, Dr. M. S. Krishnan, and Prof. S. P. Agharkar, was appointed to draw up a statement explaining the work of the Committee and clarifying the situation in reference to the resolutions of the Bangalore Conference. Copies of this statement were sent to scientists all over India, so that it is unnecessary to include the statement in this report.

In a letter dated 16th June, 1934, to Dr. L. L. Fermor, Sir C. V. Raman proposed a scheme for the federation of the existing Academies of Sciences in India, viz. the Asiatic Society of Bengal, the U.P. Academy of Sciences, Allahabad, and the Indian Academy of Sciences, Bangalore, as an alternative to the Academy proposed to be created by the Indian Science Congress Association. This scheme was very carefully considered by the Academy Committee in its third meeting on 28th and 29th June, but the conclusion arrived at was that as the Academy Committee had received a definite mandate from a body representative of all Sciences in India, it was too late for the Committee to abandon the work which it had undertaken. It was decided, however, to remodel the scheme of the Committee for the proposed Academy on the basis of a federal and co-ordinating Academy, and the Committee's views were duly communicated to Sir C. V. Raman by Dr. Fermor in his reply. It was also decided to change the name of the proposed Academy to 'The National Academy of Sciences of India '. The functions of the proposed institution were explained in ' A Note on the Aims and Objects of a National Academy of Sciences of India ', prepared by the Chairman and the Organising Secretaries of the Academy Committee in accordance with the discussions of the Committee on June 28th and 29th, 1934

At the fourth meeting of the Academy Committee held on the 11th August, Sir C. V. Raman's reply to Dr. Fermor's letter was recorded, and various indirect proposals for a ' compromise ' with Bangalore were considered. After careful consideration the Committee came to the conclusion that none of these schemes provided a satisfactory basis for agreement, as they involved the recognition of the Bangalore Academy as the central institution for India with its headquarters at Bangalore at least for the first 3 years. What the Committee desired was not a ' compromise ' but the co-operation of all scientists in their individual capacity as also of all scientific organisations.

The fifth meeting of the Academy Committee was held on the 15th and 16th September in Calcutta. It was attended by Sir C. V. Raman, Prof. B. Venkatesachar, and Prof. C. R. Narayan Rao, who came to Calcutta to discuss the possibility of agreement between the Academy Committee and the Indian Academy of Sciences, Bangalore. At this meeting all points of view were fully discussed and four resolutions were adopted unanimously :—

(1) That the name of the proposed National Academy should be changed to 'The National Institute of Sciences of India'.

(2) Publications of the National Institute should include :—

- (i) A summary of proceedings or papers read before all co-operating Academies of Science in India ;
- (ii) Such memoirs as may be considered necessary ; and
- (iii) Annual summary of progress of science in India.

(3) (*a*) The Indian Academy of Sciences, Bangalore, would not promote the formation of branches of the Academy, but could form local centres of its own members. This would apply *mutatis mutandis* to all other co-operating Academies.

(*b*) The proposed National Institute would not form branches in other parts of India, but would be prepared to co-operate not only with the 3 existing Academies, but also with such other Academies of sufficient status as may be formed in other parts of India.

(4) The agreement was to be subject to confirmation by the Foundation Fellows of the proposed National Institute to whom invitations had already been issued.

In addition it had been agreed that the functions of the National Institute were also to include :—

(1) The organisation of symposia and general discussions.

(2) The distribution of annual grants for special purposes not provided for in departmental programmes.

Sir C. V. Raman also withdrew his resignation and rejoined the Academy Committee.

At the sixth meeting of the Academy Committee held on the 3rd and 4th of November at Calcutta, the views of the Foundation Fellows on the revised scheme involving the change of the name of the institution, were considered. The replies of the Foundation Fellows who had expressed their views in response to the invitation of the Academy Committee, showed that 21 approved of the change, while 20 were against it. Further the consensus of opinion amongst the members of the Academy Committee present was that the spirit of the September agreement had not been observed by Sir C. V. Raman ; it was, therefore, decided to clear up issues by officially addressing the Secretary of the Indian Academy of Sciences, Bangalore. It was requested that a reply to this letter should be sent in time for consideration at the next meeting of the Academy Committee on the 24th November and that certain changes that were rendered necessary by the spirit of the agreement of the 16th September, should be made in the Memorandum of Association and Constitution of the Indian Academy of Sciences, Bangalore.

The seventh meeting of the Academy Committee was held on the 24th of November. At this meeting Sir C. V. Raman, Prof. B. Venkatesachar, and Prof. C. R. Narayan Rao were present both as members of the Academy

Committee and as representing the views of the Indian Academy of Sciences, Bangalore. After a long discussion the representatives of the Bangalore Academy agreed to propose for acceptance by their Council a number of changes in their original Memorandum of Association and they also reiterated their pledge of observing the terms of the September agreement both in letter and in spirit.

The differences between the proposed National Institute of Sciences of India and the Indian Academy of Sciences, Bangalore, having thus been satisfactorily composed on the basis of co-operation between the various bodies, the members of the Academy Committee present at this meeting (17 in number) found themselves able unanimously to agree to adhere to the name of 'National Institute of Sciences of India' and to recommend this both to the Foundation Fellows and to the General Committee of the Indian Science Congress Association for their final acceptance.

The members of the General Committee of the Indian Science Congress Association will at this point ask what is the final position now that agreement has been obtained. The aims and objects of the proposed National Academy of Sciences of India were described in a note prepared after the Academy Committee meeting of the 28th and 29th June. As a result of the September agreement, this note was remodelled to suit the changed situation, and a copy of the remodelled note is attached to this report as Appendix. The only important change is the substitution of the word 'Institute' for 'Academy', the other changes being purely verbal, and on the whole the Academy Committee consider that the term 'Institute' is more suitable than 'Academy' in view of the co-ordinating position it expects to occupy *vis-a-vis* the three existing bodies of Academy rank, namely the Asiatic Society of Bengal, the U.P. Academy of Sciences, and the Indian Academy of Sciences of Bangalore.

At the meeting of the 24th November it was resolved also to authorise the Organising Secretaries to print and circulate to the Foundation Fellows the draft rules that had been framed. A copy of these draft rules is appended to this statement, and it is proposed to treat them as provisional rules for the first year of the National Institute's existence and to pass them finally at the first Annual General Meeting of the Institute. The rules do not prescribe any place as the headquarters of the National Institute, and on this point it is necessary to mention that at Sir C. V. Raman's suggestion the headquarters of the National Institute have been provisionally fixed at Calcutta. In this connection it is also necessary to add that the Asiatic Society of Bengal is prepared to offer accommodation for the offices of the Institute, if so requested. The Committee agreed that the present situation clearly indicates that a commencement should be made in Calcutta and that the first Council should, therefore, be formed on this basis. Nevertheless, since according to the Note on the Aims and Objects of the Institute circulated to the Foundation Fellows the vote of the Fellows is to be taken on the location of the headquarters of the Institute, it is proposed, during the first year, to invite the opinion of the Foundation Fellows on this point.

In the draft rules provision is made for a Council of 25, so as to allot enough places to headquarters to ensure a working quorum being always obtainable, as well as to allot one place each to as many of the centres of scientific research as possible. It has also been decided to provide for an additional Vice-President and an additional Member of Council to be appointed by each of the Academies co-operating with the National Institute. Further, in view of the importance of the Indian Science Congress Association and its historical relationship to the new National Institute of Sciences, provision has also been made for an additional Vice-President and an additional Member of Council to represent the Indian Science Congress Association. In view of the above, the following provisional Council of the National Institute has been selected for recommendation to the Foundation Fellows for their approval :—

President :

Dr. L. L. Fermor, O.B.E., D.Sc. (Lond.), A.R.S.M., M.Inst.M.M., F.G.S., F.R.S., F.A.S.B., Director, Geological Survey of India, Indian Museum, Calcutta.

Vice-Presidents :—

Brigadier H. J. Couchman, D.S.O., M.C., Surveyor-General of India, Calcutta.

Rai Bahadur Prof. S. R. Kashyap, B.A., M.Sc., D.Sc., I.E.S., F.A.S.B., Professor of Botany, Government College, Lahore (since deceased).

Treasurer :—

Dr. S. L. Hora, D.Sc. (Punjab *et* Edin.), F.L.S., F.Z.S., F.R.S.E., F.A.S.B., Superintendent, Zoological Survey of India, Indian Museum, Calcutta.

Foreign Secretary :—

Prof. M. N. Saha, D.Sc., F.R.S., F.A.S.B., Professor of Physics, Allahabad University, Allahabad.

Secretaries :—

Prof. S. P. Agharkar, M.A. (Bom.), Ph.D. (Berol.), F.L.S. (London), Ghose Professor of Botany, Calcutta University, 35, Ballygunge Circular Road, Calcutta.

Dr. A. M. Heron, D.Sc., F.G.S., F.R.G.S., F.R.S.E., Superintendent, Geological Survey of India, Indian Museum, Calcutta.

Members of Council :—

Mr. M. Afzal Hussain, M.A., M.Sc., I.A.S. Principal, Punjab Agricultural College, Lyallpur, Punjab.

Dr. Baini Prashad, D.Sc., F.R.S.E., F.L.S., F.Z.S., F.A.S.B., Director, Zoological Survey of India, Indian Museum, Calcutta.

Mr. T. P. Bhaskara Shastri, M.A., F.R.A.S., Director, Nizamiah Observatory, Begumpet, Hyderabad, Deccan.

Prof. S. S. Bhatnagar, D.Sc., University Professor of Chemistry, Director, University Chemical Laboratories, Lahore.

Mr. B. C. Burt, C.I.E., M.B.E., B.Sc., I.A.S., Agricultural Expert, Imperial Council of Agricultural Research, New Delhi (and Simla).

Prof. Ganesh Prasad, M.A., D.Sc., Hardinge Professor of Higher Mathematics, Calcutta University, 2, Samavaya Mansions, Corporation Street, Calcutta.

Prof. J. C. Ghosh, D.Sc., Head of the Department of Chemistry, University of Dacca, Ramna, Dacca.

Dr. F. H. Gravely, D.Sc., F.A.S.B., Superintendent, Government Museum, Museum House, Egmore, Madras.

Lt.-Col. R. Knowles, B.A., M.R.C.S., L.R.C.P., F.A.S.B., I.M.S., Professor of Protozoology, School of Tropical Medicine, Calcutta.

Prof. K. S. Krishnan, D.Sc., Mahendralal Sircar Professor of Physics, Indian Association for the Cultivation of Science, 210, Bow Bazar Street, Calcutta.

Prof. S. K. Mitra, D.Sc. (Cal. and Paris), Ghose Professor of Physics, Calcutta University, University College of Science, 92, Upper Circular Road, Calcutta.

Prof. J. N. Mukerji, D.Sc. (London), F.C.S , Khaira Professor of Chemistry, University College of Science, 92, Upper Circular Road, Calcutta.

Dr. C. W. B. Normand, M.A., D.Sc., Director-General of Observatories, Meteorological Office, Poona 5.

Sir C. V. Raman, Kt., M.A., D.Sc., Ph.D , LL.D., F.R.S , F.A.S.B., N.L., Director, Indian Institute of Science, Bangalore.

Prof. B. Sahni, M.A , Sc.D., D Sc., F.G.S., F A.S.B . Professor of Botany, Lucknow University, Lucknow.

Lt -Col. S. S. Sokhey, M.A., M.D., D Sc., D.T.M. & H , I M S., Director, Haffkine Institute, Parel, Bombay.

Lt.-Col. J. Taylor, D.S.O., M.D., D P.H , I M S , Director, Central Research Institute, Kasauli (Simla Hills).

Mr. C G. Trevor, C I.E., President, Imperial Forest Research Institute, Dehra Dun.

Mr. F. Ware, F.R.C.V.S., I.V.S., Director, Imperial Institute of Veterinary Research, Muktesar.

This list does not, of course, contain the names of the additional Vice-Presidents and Members of Council as these have yet to be chosen by the nominating bodies.

In view of the concord that has now been established, the Academy Committee has decided to exclude from this report to the General Committee both the details of their deliberations and also of the unfortunate controversy with the Indian Academy of Sciences, Bangalore The Committee has carried on its labours under very difficult and at times almost impossible circumstances and it hopes that the members of the General Committee of the Indian Science Congress will, after careful consideration of the report now presented, be in a position to endorse the work of its Committee, and accept its proposals for the foundation of the National Institute of Sciences of India.

S. P. AGHARKAR,
M. N SAHA,
Joint Organising Secretaries.

CALCUTTA,
3rd December, 1934.

APPENDIX

A NOTE ON THE AIMS AND OBJECTS OF THE NATIONAL INSTITUTE OF SCIENCES OF INDIA

A note on the Aims and Objects of the National Academy of Sciences of India, approved by the Academy Committee of the Indian Science Congress Association, was issued with the letter of invitation dated the 18th of August, 1934, to those gentlemen who were invited to become Foundation Fellows of the proposed National Academy of Sciences of India.

At the meeting of the Academy Committee held at Calcutta, on the 15th and 16th of September, 1934, in the rooms of the Asiatic Society of Bengal, three representatives of the Indian Academy of Sciences founded at Bangalore, namely the President and the two Secretaries, were present, and as a result of discussion then undertaken, the object of which was to provide for co-operation between the proposed National Academy and the Indian Academy of Sciences of Bangalore, as well as with the two other Academies, the Asiatic Society of Bengal and the U.P. Academy of Sciences, certain changes were decided upon. For this reason it has become necessary to reconstruct the note on our aims and objects referred to above.

In the first place it was generally accepted that a more suitable title for the body to be founded by the Indian Science Congress Association would be 'The National Institute of Sciences of India' rather than 'The National Academy' on account of the fact that the activities that the National body is to undertake are somewhat different from those of an Academy as such.

The Committee consider that an Academy must be regarded as a society that deals with a variety of branches of knowledge rather than confining itself to a single branch of studies, or to closely allied branches of studies, such as is proper to specialist societies, *e.g.* The Chemical Society of India or the Mining and Geological Institute of India. They consider also that an Academy is otherwise similar to specialist societies, and exists primarily for the holding of regular periodical meetings for the purposes of reading and discussion of papers, of course, with a view to subsequent publication.

The broadest type of Academy is one that deals with all branches of knowledge. This function is already performed by the Asiatic Society of Bengal, which is, in fact, the oldest learned Society in India, and was founded before any of the specialist societies. This society comprises in its activities both Science and Letters. Until four years ago there was only this one Society of Academy rank in India, but since that date two other Academies have been formed, namely the U.P. Academy of Sciences founded in 1930, and the Indian Academy of Sciences of Bangalore founded in 1934. These two latter societies being Academies of Science only are of more restricted scope than the Asiatic Society of Bengal, whose activities comprise both Science and Letters. This completes the list of Academies at present in India. Each of these Academies has a membership that is not restricted to the province or region within which the headquarters of the Academy is situated, and to this extent each one of these Academies may regard itself as having all-India activities.

Each Academy, however, necessarily has its headquarters in a definite town or province, and to this extent it provides greater benefits to members resident at or close to the headquarters than the members of more distant residence. This fact is recognised in practice by the Asiatic Society of Bengal and the U.P. Academy of Sciences, which charge higher fees to resident than to non-resident members. Because, therefore, of the facts of geography, each of these three Academies must be regarded as having local activities in addition to all-India activities; and the proportion between the local and all-India activities of each Academy must necessarily vary according to its history and activities. The Committee consider, therefore, that the facts of geography necessitate the existence of more than one body of Academy rank in India, and that for practical purposes even these three Academies are not sufficient to meet adequately the scientific needs of the whole of India. Scanning the list of gentlemen who are being invited to become Foundation Fellows of the National Academy, gentlemen whose names have been selected after careful consideration, with due regard to the merits of each person and without reference to regional or provincial problems, it is seen that these Fellows can be classed into 5 groups, and that about 35% of them may be regarded as resident in the tract of which Calcutta is the natural centre; about 25% of them in Southern India, of which Bangalore may be accepted as the natural centre; about 13% within convenient reach of the United Provinces; and, in addition, about 13% to whom Bombay or Poona would be the most convenient centre; and about 13% for whom Lahore would be the most convenient centre.

The full development of Science in India on an Academy basis appears, therefore, logically to require the foundation of two new Academies with centres, say, at Bombay (or Poona) and at Lahore. In devising a scheme for a National Institute of Sciences of India co-operating with the Academies, we are prepared, therefore, for the possibility that scientists whose natural centre of activity is Bombay (or Poona) on the one hand and Lahore on the other may think it advantageous to the development of Science in their regions to establish Academies of Science.

With reference to the existing Academies, a scheme of co-operation with the National Institute of Sciences of India has been devised. This scheme provides for the representation of the existing Academies upon the Council of the National Institute in the form of an additional Vice-President and an additional Member of Council for each Academy elected by the respective Academies from amongst the Fellows of the National Institute who are also members of the respective Academies. Should the scientists interested decide that it is desirable to found Academies of Science at Bombay or Poona and at Lahore, the National Institute will be prepared to offer them also an additional place as Vice-President and an additional place as a Member of Council, provided the Academies so founded contain a minimum number of Fellows of the National Institute.

It appears to be unnecessary to found a new Academy in Calcutta, as the Committee hope that the Asiatic Society of Bengal will be prepared to develop its activities on the Science side in order that this may be avoided. The Academy Committee make this recommendation with the hesitation and deference which is necessary to a body of such a distinguished past and long career as the Asiatic Society of Bengal.

The fact that an existing Academy undertakes to co-operate with the National Institute for particular purposes will not, in any way, detract from its independence or dignity, or prevent it from continuing to have all-India interests and activities.

Assuming that the three existing Academies will be prepared to adopt the scheme of co-operation with the National Institute outlined at a meeting of the Academy Committee held on September the 15th and 16th, and also that the two suggested additional Academies, if formed, will be prepared to cater for the general interests of all scientists in their natural sphere of influence, irrespective of juniority or seniority of members, it is unnecessary for the National Institute to enter into competition with them in this respect. For the National Institute we need only a body of Fellows elected for their eminence, whose general duties will be to co-ordinate scientific effort throughout India.

It is proposed that at present we should start with 125 Foundation Fellows, of whom 100 have been selected by the procedure devised by the Academy Committee, and that these 100 Fellows shall select the remaining 25 Fellows in accordance with the Academy Committee's quotas. Ten new Fellows will be elected in the first year after the formal constitution of the Institute, and 10 annually thereafter. The latter figure is not, of course, an inflexible figure, but one to which it is proposed to adhere for the first few years.

Although it is not proposed to make it compulsory that every Fellow of the National Institute shall also be a member of one of the three or more Academies, yet it is hoped that the majority will so belong. It is recognised, however, that there are likely to be a few Fellows left over who, for geographical reasons, cannot benefit by membership of any Academy, and for this reason it is not proposed to make such membership compulsory.

The proposal is that the dues required from Fellows should be an admission fee of Rs. 32 and an annual subscription of Rs. 36. If the existing Academies enter into the scheme of co-operation, it is proposed that the National Institute shall contribute to the Academies Rs. 12 per member per National Institute Fellow towards his membership subscription of his Academy. In the case where a Fellow is a member of more than one Academy, he will be asked to name the Academy to which he elects to have Rs. 12 of his subscription transferred. In the case of Fellows who do not belong to any Academy, the National Institute will retain the whole subscription.

Concerning publications, it is proposed that the National Institute should publish a summary of papers read before the co-operating Academies in order to enable the National Institute to issue a consolidated *Comptes rendus* of papers read before all the Academies. In addition, the National Institute propose to publish an Annual Review of the Progress of Science in India, dealt with subject by subject. Thirdly, in cases where Academies are unable, for financial reasons, to publish large and expensive Memoirs, the National Institute propose to undertake this duty when so requested. On the other hand, it is expected that the Academies will publish their own Journals with papers read at their meetings. Should any Academy, however, find itself financially unable to publish papers read before it, the National Institute will be prepared to consider their publication.

Concerning meetings of the National Institute, it is not the intention to hold regular periodical meetings for the reading of papers, as this work is regarded as the prime function of the Academies. To commence with, therefore, and for business purposes, two meetings only per year will be necessary, one at the headquarters of the Institute, say, during the monsoon season, and one perhaps at the city selected for the meeting of the Indian Science Congress of that year. Additional meetings for business and other purposes will be held when necessary. Proceedings of meetings of the Institute will also be published.

The above indicates the extent to which the Institute will act as a body for publication. In addition, one of the major activities at which the National Institute should aim is the organisation of a National Research Council and of National Research Committees for India when so desired by Government. Such organisations would contain not only representatives of the National Institute, but of the Academies and of the relative specialist societies, as well as of the various scientific services, and in this way co-operation will be ensured between the Institute, the Academies, the specialist scientific societies, and the Government as represented by scientific services.

The scheme of co-operation also includes that the National Institute should arrange for discussions and symposia on special topics of general natural and scientific interest as is done by the Royal Society and the Faraday Society.

Another object which we have to keep before us in accordance with the resolutions of the Indian Science Congress Association is the preservation by the Institute of a liaison between Science and Letters.

We consider that for the present this portion of our aims should be kept in abeyance and that the Institute should first be brought into being and activity as a purely Science

Institute; when this has been effected, we shall be in a position to consider what form of liaison, if any, with Letters is desirable and practicable.

With reference to finance, we shall require from the beginning funds to pay the salary of an Assistant Secretary and the expenses of an office, and for purposes of publication. We are hoping that in view of the All-India status of our National Institute, and now that concord has been established with the existing Academies, the Government of India will be prepared to contribute a suitable sum annually towards the fulfilment of our regular annual programme. In addition, the National Institute will be prepared to administer funds entrusted to it for particular scientific researches and investigations. Further we hope that wealthy men in India who have the cause of Science at heart will think it suitable to make donations towards the funds of the Institute.

Draft rules are being prepared to provide for the above objectives. Although the objects of the National Institute are thus national and co-operative in type, it is proposed to constitute its Council by direct election by the Fellows from amongst themselves. But to provide for co-operative relationship with the Academies, it is proposed to offer one additional Vice-Presidentship and one additional Membership of Council to each Academy to be elected by the Academy from amongst its members, who are Fellows of the National Institute. It is proposed that all elections to the Council shall be conducted by postal ballot.

There is, of course, no intention that the existence of our Fellows should prevent Academies from continuing their own Fellowships where such exist, or to start their own scheme of Fellowships if they think desirable There is, in fact, as will appear from this note, no intention or desire on the part of the National Institute to interfere with the activities or internal organisation of the Academies.

With reference to the revised title, in which the word 'Institute' has been substituted for the word 'Academy', it has its analogy in the *Institut de France*, to which are related five Academies, including *Academie des Inscriptions et Belles-Lettres*, and *L' Academie des Sciences.*

There is, however, a fundamental difference, namely that the French Academies are all branches of the Institute of France. In our case no such subordination or affiliation is proposed. The relationship of the Science Academies in India to the National Institute will be one of co-operation of independent bodies. There is further this difference that whereas the Institute of France is in relationship with Academies for various branches of knowledge, our National Institute is for the purposes of co-ordinating and co-operating only with the scientific activities of Academies.

This change of title necessitated discussion in the Academy Committee whether our terms of reference from the Indian Science Congress, which were to found an Academy of Sciences, would permit us to take this line. It was, however, decided that the instructions of the Indian Science Congress Association referred rather to the general problem and did not really impose on us any particular title, and that provided the organisation we propose to form carries out the objects which the instructions of the Indian Science Congress placed before us, there can be no objection to the proposed change of name.

With reference to the location of the National Institute, if a scheme of co-operation had not been devised, it might have been better to avoid locating the Institute anywhere in order to prevent any form of jealousy. This might have been arranged by means of a scheme in accordance with which the headquarters moved periodically, say every two years, from one headquarters to another. Such proposals for a peripatetic Institute would, however, have prevented the full development of the Institute and would have been contrary to the dictates of business which require that the Institute must have an office somewhere. The Committee propose to leave the choice of the headquarters to the vote of the Foundation Fellows.

As regards procedure, although the Academy Committee propose in accordance with their mandate to take all steps necessary to found this National Institute, they also propose, in accordance with the pledge given at the meeting of the General Committee of the Indian Science Congress Association held in Bombay in January, 1934, to defer the final step of actual registration until the formal ratification by the General Committee of the Indian Science Congress Association to be held in Calcutta in January, 1935. It is proposed also to hold the inaugural meeting of the National Institute during or close to the same meeting of the Indian Science Congress Association.

Provisional Rules

NAME

1. The Society shall be called the National Institute of Sciences of India.

OBJECTS

2. The objects of the National Institute of Sciences of India are--

(*a*) The promotion of natural knowledge in India including its practical application to problems of national welfare.

(*b*) To effect co-ordination between scientific academies, societies, institutions, and Government scientific departments and services.

(*c*) To act as a body of scientists of eminence for the promotion and safeguarding of the interests of scientists in India: and to represent internationally the scientific work of India.

(*d*) To act through properly constituted National Committees in which other learned academies and societies will be associated, as the National Research Council of India, for undertaking such scientific work of national and international importance as the Council may be called upon to perform by the public and by Government.

(*e*) To publish such proceedings, journals, memoirs and transactions, and other publications as may be found desirable.

(*f*) To promote and maintain a liaison between Science and Letters.

(*g*) To secure and manage funds and endowments for the promotion of Science.

(*h*) To do and perform all other acts, matters, and things that may assist in, conduce to, or be necessary for the fulfilment of the above-mentioned aims and objects of the Institute.

CONSTITUTION

3. The Institute shall consist of Ordinary Fellows and Honorary Fellows.

(*a*) **Ordinary Fellows,** the number of whom shall be limited by the method of election. Those who accept nomination as Fellows before the inauguration of the Academy up to a limit of 125 shall be the Foundation Fellows.

In the first year of the Academy not more than 10 Fellows plus such vacancies as may exist in the initial 125 Foundation Fellows shall be elected,* and thereafter annually not more than 10

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* See *foot-note* on p. 49.

Fellows shall be elected. Those Fellows, who live in India as defined in Rule 30, shall be treated as ***Resident Fellows***, whilst those who have left India permanently shall be treated as ***Non-Resident Fellows***.

(*b*) **Honorary Fellows**, the number of whom shall be limited to 50, and who shall be persons eminent for their knowledge of, or contributions to, Science, or the welfare thereof, and who are domiciled outside the territorial limits of India as defined in Rule 30.

4. Persons of all nations shall be eligible for Fellowship of the Institute.

ADMINISTRATION AND OFFICERS

5. The administration, direction, and management of the affairs of the Institute shall be entrusted to a Council composed of the Officers of the Institute—namely, a President, two Vice-Presidents, a Treasurer, two Secretaries, a Foreign Secretary, and such Additional Secretaries as the Council may, from time to time, nominate in accordance with Rule 51—with as many other Ordinary Fellows as shall with these Officers make up a minimum total of 15, or a maximum of 25. In addition, there shall be provision for Additional Vice-Presidents and Additional Members of Council to the number of one Vice-President and one Member of Council for each of the existing science academies in India, selected from amongst the Fellows of the National Institute who are Members of such existing academies, as well as from any additional science academies that may be started and comply with requirements of the regulations of the National Institute in this respect. Further there shall be provision that the President of the Indian Science Congress Association for the time being shall be an Additional Vice-President of the Institute and that one of the Secretaries of the I.S.C.A. for the time being shall be an Additional Member of Council, in each case provided that the President or Secretary is a Fellow of the Institute. In cases where such President or Secretary is not a Fellow of the Institute, the I.S.C.A. shall be entitled to nominate from amongst the Fellows of the Institute another representative as Additional Vice-President or Additional Member of Council. Further, past Presidents, up to a limit of 6, who have most recently held office of President shall be *ex-officio* Additional Members of the Council.

6. Not more than one of the offices of the President, Vice-President and Secretary shall be held by the same person.

ELECTION AND ADMISSION OF ORDINARY FELLOWS

7. The election of Ordinary Fellows shall be governed by regulations framed by the Council, but these regulations shall provide for the following points, from which departure can be made only after reference to the whole body of Fellows :—

(*a*) In the first year of the Institute the number of new Fellows shall be limited to 10 plus such vacancies as may exist in the initial 125 Foundation Fellows.*

(*b*) In succeeding years, the number shall be limited to 10 annually.

(*c*) Each candidate shall require a certificate to be signed on personal knowledge by a minimum of 4 Fellows.

(*d*) The selection from the total list of candidates available of candidates recommended to the Institute for election shall be made by the Council, but the election shall be conducted by postal ballot of all the Fellows.

(*e*) Provision for the election of persons who, in the opinion of the Council of the Institute, either have rendered conspicuous service to the cause of Science or are such that their election would be of signal benefit to the Institute; provided that not more than two persons shall be so elected in any one year, and that if two persons be elected in any year, there shall be no election in the following year.

8. The Secretaries shall send a written announcement of the election to candidates who have been duly elected, and shall therewith send a copy of the Obligation to be signed, and of the Rules and Regulations for the time being in force.

9. An admission fee of Rs. 32 shall be due on election from the person elected. If this fee be not paid within three months after issue to such person of the notice of his election as Fellow, such election shall become null and void.

10. No person, although duly elected according to the Rules and Regulations of the Institute, shall be entitled to exercise the rights and privileges of Fellowship, nor shall his name be entered in the list of Fellows, until he has paid his admission fee and his first annual subscription, and until he has signed and returned the Obligation.

11. The payment of such admission fee and first annual subscription and the signature of the Obligation shall be the commencement of effective Fellowship and shall be equivalent to the expression of a direct acquies-

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* In accordance with the undertaking given at the meeting of the General Committee of the Indian Science Congress Association held on January 4th, 1935, at which the Constitution of the National Institute of Sciences of India was approved, the Council of the National Institute decided, at their meeting held on the 8th January, 1935, to substitute 25 for 10 in rule 3 (*a*) and 7 (*a*).

cence in all Rules and Regulations of the Institute then in existence, and of an undertaking to be bound by them and by such as may thereafter be passed, as hereinafter provided.

11A. Rules 9 to 11 shall be applicable to the Foundation Fellows as if they had been elected on the date of inauguration of the Institute.

12. Rules 9 to 11 shall be written or printed on the letter of announcement of election sent to Fellows by the Secretaries under Rule 8.

12A. In the case of the Foundation Fellows the Secretaries shall send a written announcement of the inauguration of the Institute, and therewith they shall send a copy of the Obligation to be signed and of the Rules and Regulations, and Rules 9 to 11A shall be written or printed on the letter of announcement.

13. Every Fellow who has paid his Admission fee and Subscription for the current year, and has returned the Obligation, signed and addressed to the Secretaries shall, at the first Ordinary General Meeting whereat he shall be present, subscribe a duplicate of the aforesaid Obligation, in a book to be kept for that purpose: after which he shall be presented by some Fellow to the Chairman, who, addressing him aloud by name, shall say, 'In the name and by the authority of the National Institute of Sciences of India, I admit you a Fellow thereof'. Provided that in the case of Foundation Fellows this Rule shall not apply.

THE OBLIGATION TO BE SUBSCRIBED

14. Every person elected a Fellow of the Institute shall, before his admission, subscribe the Obligation in the following words :—

I, the undersigned, do hereby engage that I will endeavour to promote the interest and welfare of the National Institute of Sciences of India, and observe its Rules and Regulations, so long as I shall continue a Fellow thereof.

(Signed)

ELECTION OF HONORARY FELLOWS

15. The procedure for electing Honorary Fellows shall be the same as for the election of Ordinary Fellows, but the numbers shall be limited to eight in the first year of the Institute and four in each successive year.

PRIVILEGES OF FELLOWS

16. Resident Ordinary Fellows shall be entitled to the following rights and privileges :—

(*a*) To be present and vote at all General Meetings.

(*b*) To propose and recommend under Rule 7(*c*) candidates for Ordinary Fellowship.

(*c*) To introduce visitors at the Ordinary General Meetings of the Institute.

(*d*) To have personal access to the Library of the Institute.

(*e*) To take out books, plates, drawings, manuscripts, etc. from the Library, subject to such Regulations as may be prescribed by the Council.

(*f*) To receive, *gratis*, copies of the publications of the Institute issued during the continuance of their Fellowship, and, subject to the discretion of the Council, to purchase, at a reduced price, the back numbers of the Institute's publications.

(*g*) To fill any office in the Institute on being duly elected thereto, subject, however, to the proviso that any Fellow appointed to any office in the Institute to which a salary or emolument is attached shall lose, for the time being, the privilege of voting.

(*h*) To offer papers and communications to be read before the meetings of the Institute.

17. Non-Resident Ordinary Fellows shall be entitled to the privileges contained in Clauses (*a*), (*b*), (*d*), (*f*), and (*h*) of the preceding Rule, and to serve on any Committee appointed by Council, save that they shall not be entitled to vote except on such Committee.

18. Honorary Fellows shall be entitled to the privileges contained in Clauses (*a*), (*d*), (*f*), and (*h*) of the preceding Rule, and to serve on any Committee appointed by the Council, save that they shall not be entitled to vote except on such Committee.

SUBSCRIPTIONS OF FELLOWS

19. The subscription of *Resident* Ordinary Fellows shall be Rs. 36 per year and of *Non-Resident* Ordinary Fellows Rs. 16 per year. In the case of Resident Fellows who are members of other Science Academies in India working in co-operation with the National Institute in accordance with the Regulations for co-operating Academies, a contribution amounting to Rs. 12 annually shall be made by the National Institute from the Fellow's subscription to the National Institute towards his subscription to such Science Academy. In cases where a Fellow of the National Institute is a member of more than one such other Academy he shall be entitled to nominate the

Academy to which this contribution of Rs. 12 annually is to be made on his behalf.

20. Subscriptions shall be due on the first day of each calendar year.

21. The full subscription of the year in which a person is elected a Fellow shall be due from him on election, unless such election have taken place after the 30th of June, in which case only half the annual subscription shall be due in respect of that year. Should such election have taken place after the 31st October, no subscription shall be due from him in respect of the remainder of that calendar year.

22. In the event of a Resident Fellow becoming Non-Resident, or of a Non-Resident becoming Resident, his subscription shall not change until the first day of the ensuing year.

23. No Fellow whose subscription is in arrears for six months shall be permitted to enjoy the rights or exercise the privileges of a Fellow, until he shall have paid up all arrears due from him.

24. No admission fees or subscriptions shall be due from Honorary Fellows.

25. Any Fellow of the Institute may, after he shall have paid his admission fee, compound for the payment of all future subscriptions as a Resident Fellow, by the payment in a single sum or by instalments within one Calendar year of Rs. 450.

26. Any Fellow already belonging to the Institute may at any time compound for all future subscriptions as a Resident Fellow by the payment of the above compounding fee, less Rs. 15 for each full annual subscription of Rs. 36 he may have already paid as a Resident Fellow, provided always that under no circumstances shall the composition fee be reduced below Rs. 150.

27. Any Fellow of the Institute who has become a Non-Resident Fellow may compound for the payment of all future subscriptions as a Non-Resident Fellow by the payment of Rs. 200, less Rs. 7 for each full annual subscription of Rs. 36 he may have already paid as a Resident Fellow and each annual subscription of Rs. 16 he may have already paid as a Non-Resident Fellow, provided always that under no circumstances shall the composition fee be reduced below Rs. 70.

28. Non-Resident Fellows who have already compounded for their Non-Resident subscriptions under the last Rule and who again become Resident Fellows shall be liable to pay an annual subscription equal to the difference between the Resident and Non-Resident rates of subscription, during such time as they shall remain Resident. Such additional subscription to be chargeable under the provisions of Rule 22.

29. Any Non-Resident Fellow who has already compounded for his Non-Resident subscription under Rule 27 and who again becomes a Resident Fellow may at any time compound for his future additional subscriptions as a Resident Fellow by the payment of a single sum of Rs. 250 less Rs. 8

for each full annual subscription of Rs. 36 he may have already paid as a Resident Fellow, provided that under no circumstances shall the total additional composition fee be reduced below Rs. 80.

30. For the purposes of these Rules Resident Fellows *in India* shall be considered to include all those living in any part of India and its dependencies, including Aden, or in Ceylon and Straits Settlements, or elsewhere between the parallels of 60° and 100°E. Longitude, and from the Equator to 40° North Latitude. Fellows beyond these limits shall be considered Non-Resident Fellows.

CESSATION OF FELLOWSHIP

31. Any Fellow may withdraw from the Institute by signifying his wish to do so, by letter addressed to the Secretaries.

32. A letter of withdrawal may be cancelled, at the request of the sender, within six months of its receipt by the Secretaries on payment of all sums for which the Fellow would have been liable had his Fellowship not been interrupted; and he shall thereupon recover all rights of Fellowship, without the form of re-election.

33. Any Fellow who shall cease to be a Fellow of the Institute, either by voluntary withdrawal or by forfeiture of his Fellowship, under Rules 35 and 38, shall continue liable to the payment of the annual subscription until he shall have discharged all sums (if any) due by him to the Institute, and shall have returned all books or other property (if any) borrowed by him from the Institute, or shall have made full compensation for the same if lost, injured, or not forthcoming.

34. Fellows who have withdrawn from the Institute shall be eligible for re-election; and, if re-elected, only half the usual admission fee shall be due from them.

35. When any Ordinary Fellow shall have omitted to pay the subscriptions of two successive years, the Council shall cause a registered letter to be sent to him, directed to his last known address, informing him of the amount of the sums due by him and that, unless they are paid within six months from the receipt of such letter, his name will be struck off the list of Fellows as provided in the next Rule.

36. If he omits to pay the amount within the time so limited, his name shall be suspended as a defaulter at any Ordinary General Meeting, and, unless the amount be paid in the meantime, shall remain so suspended at the Institute's Offices till the next Ordinary General Meeting when the Chairman shall declare such Fellow to be removed from the Institute for non-payment. This fact shall be notified in the *Proceedings* of the Institute.

37. A person who has ceased to be a Fellow under the operation of Rules 35 and 36 may again be made a Fellow by a resolution of a General

Meeting, on payment of all arrears and such further subscriptions as he would have been chargeable with under these Rules if his Fellowship had continued: but he shall not be eligible for election under Rule 7.

38. If any Fellow of the Institute shall wilfully disobey Rules or Orders of the Institute or Council, or shall commit wilful breach of order at any of the General Meetings, or, having unwittingly committed, shall persist in any disobedience or breach of order, after being admonished by the President, or if for any other reasons it shall appear to the Council that the name of a Fellow should not remain on the rolls, he shall be liable to be removed from the Institute. Whenever there shall appear cause, as aforesaid, for the removal of a Fellow from the Institute, if a majority of the Council shall, after due deliberation, determine by ballot, to propose to the Institute the removal of the said Fellow, the President shall, at any Ordinary General Meeting of the Institute, announce from the Chair such determination of the Council; and at the Meeting after that at which the said announcement has been made, the proposition shall be submitted to ballot. If three-fourths of the Fellows present and voting at such Ordinary General Meeting vote for the removal of such Fellow, he shall be removed from the Institute.

39. Fellows removed under the operation of Rule 38 shall not be eligible for re-election until the expiration of one year from the date of such removal

THE COUNCIL AND OFFICERS

40. The election of Officers and other members of the Council shall take place at the Annual General Meeting of the Institute.

41. The Council shall prepare a list of the names of those persons whom it recommends for election as President, Vice-Presidents, Secretaries, Foreign Secretary, Treasurer, Additional Secretaries, and other Members of the Council for the ensuing year; such lists shall be printed, and a copy sent by post to each Resident Fellow of the Institute at least one month before the date selected for the Annual General Meeting of the Institute. These voting lists shall have a blank column for such alterations as any Fellow may wish to make. These voting papers shall be returned to the Secretaries at least a week before the date fixed for an Annual Meeting. The manner of election shall be as follows:—

(*a*) Two scrutineers shall be appointed by the Chairman with the approbation of the majority of the Fellows present.

(*b*) These scrutineers shall count the voting lists, and shall report to the Chairman the names of those having a majority of votes for composing the Officers and other Members of the Council of the Institute, and these names shall be announced from the Chair.

(*c*) If any list contains more than the proper number of names, or include the name of a candidate who is not eligible, it shall be void for uncertainty, and shall not be regarded by the scrutineers.

(*d*) If there be an equal number of votes for any two or more candidates, the scrutineers shall announce the fact, and shall proceed to decide by lot which candidate shall have the preference.

42. No person shall hold the office of President for more than two consecutive years, nor after vacating office shall a person who has held the office of President be eligible for re-election until after the fifth Annual Meeting following that at which he vacated the office of President. No Vice-President shall be eligible to hold office as such for more than two consecutive years, and no person on retirement from the office of Vice-President shall be eligible for re-election until after the expiry of one year. For the purpose of this Rule, the Vice-Presidents of the National Institute and the Additional Vice-Presidents representing Co-operating Academies, shall be treated as each in separate categories.

43. Each year the three senior Members of the Council not being the President, Treasurer, or Secretaries, shall retire from the Council and shall not be eligible for re-election until after the lapse of one year from the date of their retirement. In the event of there being more than three Members of Council of equal seniority, the retirement shall be decided by lot. Additional Vice-Presidents and Additional Members of Council representing the Co-operating Academies and the Indian Science Congress Association shall not be governed by this Rule.

44 In the event of a vacancy occurring during the year in the office of President, Vice-President, Secretary, Treasurer, or Member of the Council, it shall be competent to the remaining Members of the Council to fill up such vacancy, subject to its confirmation by the next subsequent Ordinary General Meeting The Council may also, for specified reasons and subject to the same confirmation, elect Additional Members as occasion may require, within the sanctioned maximum number.

45. The Council as constituted in accordance with these Rules shall continue in office notwithstanding that their period of office may have, in fact, expired, until their successors have been duly appointed.

46. In the absence of the President from whatever cause, his duties will devolve in the following order of seniority .—Vice-Presidents, Additional Vice-Presidents, and Members of Council. In the case of the sudden vacation of office in the interval between two Meetings of the Council by the Treasurer, or any of the Secretaries, the President shall designate one of the Members of the Council to take his place and exercise his functions, until the next Meeting of the Council. In the case of the absence of both the Secretaries from a Meeting of the Council or of the Institute, the Chairman shall designate another Member of Council to take his place and exercise his functions during the Meeting or until the next Meeting of the Council.

46A. In the absence from Headquarters either of the Secretaries or the Treasurer, the President shall designate one of the Members of the Council to continue his functions until his return to Headquarters, subject to the confirmation of the Council at the first opportunity. Such Member of Council shall be entitled to sign papers for Secretary or Treasurer respectively. (*Adopted by the Council at its meeting held on January 8th, 1935.*)

47. The powers and duties of the Council shall be as follows :—

(*a*) To manage the affairs of the Institute, and for such purpose to make such Regulations as may to them appear conducive to the good administration of the Institute and the attainment of the aims and objects of its foundation : provided always that such Regulations be not inconsistent with anything contained in these Rules, that they be reported for the information of the next Ordinary General Meeting, and that they be subject to rescission or alteration by the Council, or by any General Meeting.

(*b*) To consider, in the first instance, and before submission to a General Meeting, all communications addressed to the Institute, and to regulate the order and manner in which such communications shall be laid before the General Meeting.

(*c*) To superintend and direct the publication of the periodical or other works published by the Institute.

(*d*) Subject to confirmation by the next subsequent General Meeting, to appoint as many salaried officers, Clerks, or Servants, as they may deem necessary ; to define their duties, allowances, salaries, gratuities, and privileges ; and to suspend or dismiss them, or dispense with their services, as occasion may require.

(*e*) To exchange for other property, or otherwise dispose of in such a manner as may, in their opinion, best conduce to advance the objects and interests of the Institute, any duplicate books, maps, specimens, etc., belonging to the Institute.

(*f*) To prepare and submit to the Annual General Meeting a Report on the general concerns of the Institute. Such report shall set forth the income and expenditure for the calendar year, the balance in hand, the debts and assets, the estimated income and expenditure of the succeeding year, the prosperity, or otherwise, of the Academy, and the progress of the Library. The Report shall also include an Abstract of the Proceedings of the Council during the year.

(*g*) In conformity with the provisions of the Registration Act No. XXI of 1860 (Sections 9 and 10), after the Institute has been registered, the Council shall be empowered, subject to the sanction of an Ordinary General Meeting, to take legal proceedings under the Act for the recovery of any sums due by Fellows who, after receiving due notice of their liabilities, shall refuse or fail to discharge them.

48. The powers and duties of the President shall be as follows :—

(*a*) To preside at all Meetings of the Institute and of the Council, and to regulate the proceedings at such Meetings.

(*b*) To ensure due effect being given to these Rules, and to the Regulations, made by the Council under Rule 47, Clause (*a*).

(*c*) To be *ex-officio* Member of all Committees appointed by the Council.

(*d*) In the case of doubt as to the interpretation of any of these Rules, to decide on the interpretation. In such case the President's interpretation shall hold until the next Meeting of the Council, when the interpretation of the Rule should be discussed and finally determined.

49. The duties of the Secretaries, subject to such delegation of duties as may be made in accordance with Rule 52, shall be as follows :—

(*a*) To conduct the correspondence of the Institute and of the Council, and to sign all letters and papers emanating from the Institute, except in so far as other provision is made in these Rules.

(*b*) To attend the Meetings of the Institute and of the Council. To take minutes of the proceedings of such Meetings during their progress ; and, at the commencement of every such Meeting, to read aloud the minutes of the previous Meeting.

(*c*) At the Ordinary General Meetings, to announce the presents made to the Institute since their last Meeting ; to read the names of candidates for Fellowship, the original papers communicated, and the letters addressed to the Institute.

(*d*) To prepare for submission to the Annual General Meeting a list of Fellows, corrected to the close of the previous year.

(*e*) To enter or cause to be entered, in the Minute-books, all the proceedings of the Institute and of the Council before the following Meeting, and to see that all letters and papers and documents of every kind connected with the business of the Institute are properly filed and preserved.

(*f*) To edit the Publications of the Institute, unless a separate Editor be appointed by the Council.

(*g*) To exercise general supervision over the servants and affairs of the Institute, and to assist in carrying out these Rules, and the Regulations and Orders made by the Council under Rule 47, Clause (*a*).

(*h*) To be *ex-officio* Members of all Committees appointed by the Council.

50. The duty of the Secretary for Foreign Correspondence shall be to conduct correspondence with foreign parts, relating to the business of the Institute, to return thanks for presents from foreigners made to the Institute, and to forward to persons elected Honorary Fellows the Diplomas certifying their election into the Institute.

51. The Additional Secretaries, if any and when more than one, may, by mutual agreement among themselves and with the Secretaries, and subject to the general control of the Council, make such partition of their duties as they may find most convenient. The arrangements made by them, and any alterations in the same, shall be communicated to the Meeting of the Council which shall take place next after such arrangement or alteration.

52. Should the Institute find it desirable to entertain the services of a paid Assistant Secretary, such portion of the duties of the Secretaries outlined in Rule 49 may be delegated to him as the Council may decide.

53. The Treasurer shall receive and hold for the use of the Institute, subject to Rule 70, all moneys paid to the Institute ; he shall disburse all sums due from the Institute and shall keep exact accounts of all such receipts and payments. Disbursements exceeding one hundred rupees shall be made only by order of the Council, or of a Committee of the Council, under signature of the Chairman of the Meeting at which the order was passed. The Treasurer shall be *ex-officio* Member of all Committees appointed by the Council.

54. At the expiration of every half year, the Treasurer shall prepare a list of the names of those Fellows who may be in arrears of their subscriptions for six or more months, and shall submit it for the orders of the Council at the next Council Meeting.

55. The Editor or Editors shall be responsible for the preparation and printing of the publications of the Institute, and shall have the right of direct correspondence with the Authors and with the Press. He or they must be chosen from amongst the Members of the Council.

MEETINGS OF THE INSTITUTE

56. General Meetings of the Institute shall be of three kinds, viz. :—

I Ordinary General Meetings.
II. Annual General Meetings.
III. Extraordinary General Meetings.

57. The following Rules shall be applicable to all General Meetings of the Institute :—

(*a*) Seven Ordinary Fellows shall constitute a *quorum*.

(*b*) The President or, in his absence, one of the Vice-Presidents, or, in their absence, one of the Additional Vice-Presidents shall take the Chair; in their absence, the Senior Member of the Council present shall take the Chair. If neither the President, nor one of the Vice-Presidents, nor one of the Additional Vice-Presidents, nor a Member of the Council be present, on the expiration of fifteen minutes after the hour fixed for the Meeting, the Fellows present shall proceed to elect a Chairman.

(*c*) The business of each Meeting shall be proceeded with in the order hereinafter prescribed in Rules 60 and 61, provided always that, on written notice being given to the President or one of the Secretaries, not less than 48 hours before the hour of Meeting, a motion for the immediate transaction of urgent business may be made; and if such motion be seconded and carried, this Rule shall be suspended.

(*d*) With the exception mentioned in the last Rule, notice of motion on any matter of importance shall be given at the General Meeting preceding that on which the subject is to be disposed of, or by letter not less than one month before the General Meeting at which the subject is to be disposed, in order that Fellows who take an interest in the question may have an opportunity of informing themselves regarding it and expressing their assent or dissent; and no motion of which notice has not been given shall be carried at the Meeting at which it is proposed, if the President or Chairman of the Meeting rules that it should be postponed.

(*e*) All motions and amendments, except those emanating from the Council, shall require to be seconded; otherwise they cannot be put. Amendments must be in writing, unless excused by the Chairman. Not more than a single amendment to the original question shall be laid before the Meeting at one time. When any such amendment has been negatived, or has been allowed to take the place of the original motion, other amendments involving fresh points may be proposed.

(*f*) Each Ordinary Fellow present is entitled to speak once and once only, to each substantive motion and to each amendment. Nothing in this Rule shall be construed to prevent any Ordinary Fellow from addressing the Chairman on a point of order, or to prevent the mover of an original motion, with the permission of the Meeting, from speaking a second time by way of explanation or reply.

(*g*) The usual method of voting shall be by show of hands; provided always that the votes on any particular subject may be taken by ballot, on a motion to that effect duly carried; and, in the cases especially provided for by these Rules, the votes shall be so taken.

(*h*) The Chairman's decision on the show of hands shall be final, unless a division be called for. It shall be competent to any Ordinary Fellow present to call for a division.

(*i*) The Chairman shall not vote with the rest of the Meeting; but when the votes for and against are equal, he shall have a casting vote.

(*j*) Any Ordinary Fellow shall have the right of recording his protest, together with the reasons for the same, against the decision of the majority upon any question: provided that such protest be forwarded in writing to one of the Secretaries within two weeks from the date of the Meeting at which the decision protested against was arrived at.

58. The first Ordinary General Meeting of the Institute shall be held at such place and at such time, after the inauguration of the Institute, as the Provisional Council may decide.

58A. The Provisional Council shall be the Council appointed by the Academy Committee of the Indian Science Congress Association in consultation with the Foundation Fellows. The Provisional Council shall become the first Council of the National Institute on the inauguration thereof.

59. Subsequent General Meetings shall be held at such times and in such places as the Council may decide, so that the total number of General Meetings held during a calendar year is not less than two, of which one should be held at the city selected for the Meeting of the Indian Science Congress Association for that year and during or close to the session thereof; and the other should be held during the monsoon period at the headquarters of the Institute. One of the meetings held during the year shall be termed the Annual General Meeting, and the other, or others, the Ordinary General Meetings.

60. The order of business at such Meetings shall be as follows:—

(*a*) The minutes of the last Meeting shall be read and confirmed after correction, if necessary, and signed by the Chairman.

(*b*) The presents made to the Institute since their last Meeting shall be announced and exhibited.

(*c*) Such business as is necessary in connection with the election of Fellows according to the Regulations framed by the Council shall be transacted.

(*d*) Notice of intended motions shall be given.

(*e*) Motions of which notice was given at the preceding Meeting or by post in accordance with Rule 57, Clause (*d*), shall be disposed of, save as provided in Clause (*f*) of this Rule and in Clauses (*c*) and (*d*) of Rule 57.

(*f*) Matters of current business and routine shall be disposed of. If any question arise as to whether any particular question is one of current business and routine, it shall be decided by the Chairman.

(*g*) Reports and communications from the Council shall be submitted for consideration.

(*h*) Papers and communications received by the Institute shall be read in the order prescribed by the Council.

(*i*) The Chairman shall announce the names of new Fellows and Honorary Fellows, if any, elected at the Meeting.

(*j*) The Chairman shall have the power, when he considers that the Meeting has been unduly prolonged, to order any uncompleted business, except that provided for in (*i*), to stand over to the next Meeting.

61. The Annual General Meeting of the Institute shall be held under the following Rules and for the transaction of the following business :—

(*a*) The Meeting shall be held on such date and in such place as the Council may prescribe. If a *quorum* be not present, the Meeting shall stand adjourned until a date to be decided by the Chairman not more than two weeks later.

(*b*) Notice of the Meeting, of the hour and date at which it is to be held, and the place of Meeting, and of the business to be transacted thereat, shall be given to Fellows not less than one month before, and shall be given in two or more newspapers seven days at least previously.

(*c*) The business to be transacted at the Meeting shall be (1) to elect the Officers and other Members of the Council for the ensuing year as provided for in Rule 41 ; (2) to hear the Annual Report prepared by the Council in accordance with the provisions of Rule 47, Clause (*f*) ; (3) to elect Ordinary Fellows unless the Council decide that this can be more conveniently done at a Meeting of the Council or at an Ordinary General Meeting; (4) to transact other business of which notice has been given as provided for in Clause (*b*); (5) to hear the Presidential Address.

62. The following Rules shall be applicable to Extraordinary General Meetings :—

(*a*) Such Meetings may be convened by a majority of the Council, and shall be convened by the President, when called on to do so by a requisition signed by not less than ten Ordinary Fellows, and stating the special business for which it is desirable that an Extraordinary General Meeting should be convened.

(b) Notice of the day and hour of the Meeting, and of the special business to be transacted thereat shall be given, one month previously in three newspapers in India; provided that, if the business be very urgent, it shall be competent to the Council to substitute any earlier notice than that of one month; but no business of the nature specified in Rule 67, Clause (c), shall be deemed urgent, within the meaning of this Clause.

(c) No other business than that included in the notice shall be transacted at such Meeting, nor shall any stranger be permitted to be present thereat.

MEETINGS OF THE COUNCIL AND OF COMMITTEES APPOINTED BY THE COUNCIL

63. The following Rules shall be applicable to Meetings of the Council:—

(a) The Council shall meet at such times as may be deemed advisable, and may make such Regulations not inconsistent with these Rules as they may think proper for the summoning and holding of the Meetings of Council and for the transaction of business at such Meetings.

(b) The President may himself also summon a Special Meeting of the Council giving notice to all other Fellows.

(c) Five members shall form a *quorum*.

(d) The President, or, in his absence, one of the Vice-Presidents shall take the Chair. If neither the President, nor one of the Vice-Presidents, be present within fifteen minutes after the hour appointed for the Meeting, the Fellows present shall elect a Chairman.

(e) The Ordinary method of voting shall be by show of hands, but the votes shall be taken by ballot on motion to this effect being duly carried, or when these Rules provide for such method of voting.

(f) The Chairman shall be entitled to vote with the other Fellows, and when the votes are equal, he shall have a second and casting vote.

(g) The voting on any question, except it be one of adjournment, shall, on the demand of any Fellow present, be postponed to the next ensuing Meeting, when such question shall be disposed of.

(h) Minutes of the proceedings of every Meeting of the Council shall be taken during their progress by one of the Secretaries, or, in the case of his absence, by some Fellow present whom the Chairman shall appoint for the occasion. The minutes shall afterwards be circulated to the Fellows present at the Meeting, for the purpose of ascertaining their correctness, and then be copied fairly in a minute book and read and signed by the Chairman at the next Meeting of the Council.

(*i*) A copy of the minutes of each meeting of the Council shall be sent to all members of the Council resident in India.

64. The Council may elect, from among their own body, Committees for the consideration of special subjects. They may also appoint Honorary Fellows or Ordinary Fellows other than Members of the Council, who are competent and well versed in the subjects to be referred to these Committees to be Members of such Committees.

65. Committees shall cause minutes to be taken of their proceedings. They shall report to the Council on all matters referred to them, producing such minutes if called for.

66. Committees shall appoint their own Chairman and Secretary. Their duties, etc., in other respects may be defined by the Council, who may also dissolve such Committees when they think proper.

VOTES OF RESIDENT FELLOWS

67. The Votes of Resident Fellows shall be taken by vote papers (transmitted to them, post-paid, by the Secretaries) in any of the following cases :—

(*a*) When the Council at their discretion consider it for the interests of the Institute that an appeal should be made from the decision of an Ordinary General Meeting to the whole body of Ordinary Fellows.

(*b*) When ten or more Ordinary Fellows sign a requisition, calling upon the President to make such an appeal.

(*c*) When any proposal is made respecting expenditure to a large amount, changes of organization, amendment or alteration of the Rules, or generally, when any question arise which, in the opinion of the Council, should be referred to the whole body of Ordinary Fellows.

68. Before circulating any question coming under Rule 67 for the votes of the general body of Fellows of the Institute the Council shall cause to be sent to every Resident Fellow, at least two weeks before the General Meeting at which such question is to be proposed, a printed circular in which shall be set forth the nature of the proposal and the reasons for it, in order that it may be duly discussed at such General Meeting. A statement of any objections that may be raised at the Meeting against the proposal shall also be circulated with the voting papers.

69. Any question referred to the votes of the whole body of Ordinary Fellows shall be brought up at the Ordinary General Meeting next after the close of one month from the issue of the voting papers. Ordinary Fellows present at such Meeting, and who have not already sent in a voting paper, shall be permitted to fill in a voting paper at such Meeting. The Chairman shall appoint two scrutineers, who shall proceed to examine the votes and report the result.

FUNDS AND ACCOUNTS

70. The accounts and vouchers of the receipts and expenditure of the Institute shall be subject to the examination of a Finance Committee of the Council at such intervals, as the Council may prescribe, and shall be subject to annual audit. Separate accounts shall be kept of all funds administered by the Institute on behalf of Government. The Annual Statement of Accounts shall, after professional audit, be printed in the *Proceedings* of the Institute.

71. All sums received from Fellows as Compounding Fees shall be regularly invested by the Treasurer as soon as possible after the receipt thereof, and only the interest accruing therefrom shall be considered available for the general expenditure of the Institute.

72. All securities and moneys, the property of the Institute, shall be lodged for safe custody in the Imperial Bank of India.

73. Cheques drawn on the Bank for sums in excess of Rs. 500 (five hundred rupees) shall be signed by the Treasurer and countersigned by a Member of Council.

MISCELLANEOUS

74. No person appointed to any Office in the Institute to which a salary or any emolument is attached shall have the privilege of voting. If an Ordinary Fellow be appointed to any such office, he shall be incapable of voting at the Meetings of the Institute as long as he continues to hold it, but shall not be deprived of any of his other privileges of Fellowship.

75. There shall be kept such record of the proceedings of the Institute, of its General Meetings and of the Meetings of Council, as shall be, from time to time, prescribed by the Council. All Ordinary Fellows shall be entitled to inspect such records.

76. All letters, notices, minutes of Fellows, and other documents connected with the business of the Institute shall be filed in the order of their dates, and shall be preserved.

77. Authors of papers published in the Institute's publications shall be entitled to receive, *gratis*, 50 copies of such papers, unless the Council otherwise prescribe.

78. When the introduction of any new Rule, or the alteration or repeal of any existing Rule, is recommended by the Council, or proposed by ten or more Ordinary Fellows, the Council shall cause to be sent to every Fellow of the Institute entitled to vote, a statement of the proposed changes and the reasons for them, with a view to the votes of the general body of Fellows being taken as directed in Rule 69. Provided always that no change in the Rules shall be valid unless a majority of *three-fourths* of the Fellows who have voted shall be in favour of the proposed changes.

NATIONAL INSTITUTE OF SCIENCES OF INDIA

List of Foundation Fellows

Prof. S. P. Agharkar, M.A., Ph.D., F.L.S., Ghose Professor of Botany, Calcutta University, 35, Ballygunge Circular Road, Calcutta.

Dr. Nazir Ahmed, M.Sc., Ph.D., Director, Indian Central Cotton Committee's Technological Laboratory, Matunga, Bombay.

Prof. S. L. Ajrekar, B.A., I.E.S., Professor of Botany, Gujarat College, Ahmedabad.

Prof. K. Ananda Rao, M.A., I.E.S., Professor of Mathematics, Presidency College, Madras.

W. C. Ash, Esq., B.Sc., M.I.C.E. etc., c/o Jessop & Co., Ltd., Calcutta.

Prof. P. R. Awati, B.A., I.E.S. etc., Professor of Zoology, Royal Institute of Science, Mayo Road, Bombay 1.

G. N. Rangaswami Ayyangar, Esq., B.A., I.A.S., Millets Specialist, Agricultural Research Institute, Lawley Road, Coimbatore, S.I.

Dr. K. D. Bagchi, D.Sc., Mycologist, Imperial Forest Research Institute, Dehra Dun, U.P.

Prof. K. N. Bahl, D.Sc., D.Phil., Professor of Zoology, Lucknow University, Lucknow.

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